Claims 4, 5, 32 and 41-60 were rejected under 35 U.S.C. 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention (page 9, paragraph 5 of the Official Action). According to the Official Action , there is only one description in the specification of administering a dosage of <50 mg/kg (pg. 4, line 10) but it does not include description of multiple administration per day of said dosage. This rejection is respectfully traversed for the following reasons.

First, the specification has been amended to recite the following:

> According to another preferred embodiment of the invention, the lysostaphin analogue(s) is administered is in an amount of 50 mg/kg or less per dose.

Support for this amendment can be found in original Claim 23. The specification also recites that "[d]osages may range from 0.5 to 200 mg/kg/day, given as single or divided doses, preferably . . . divided into two to four dosages per day" (page 10, lines 9-12 of the specification). According to the MPEP, there is no *in haec verba* requirement for written description. Therefore, newly added claim limitations may be supported through express, implicit, or inherent disclosure. See MPEP §2163. It is respectfully submitted that the recitation in the specification of 0.5 to 200 mg/kg/day, given as single or divided doses, preferably divided into two to four doses per day provides implicit support for dosages of 50 mg/kg or less administered in multiple doses per day.

It is respectfully submitted that the disclosure in the specification of the administration of lysostaphin analogue(s) in an amount of 50 mg/kg or less per dose coupled with the disclosure in the specification of the administration of multiple doses per day of lysostaphin analogue(s) provides support for the claimed subject matter.

Also according to the Official Action, there is no support in the specification for the administration of multiple doses per day of <50 mg/kg per dose of lysostaphin to humans. This rejection is respectfully traversed for the following reasons. As set forth above, the specification provides support for the administration of doses of 50 mg/kg or less per dose administered in multiple doses per day (see page 10, lines 9-12 and page 4, lines 9-10 of the specification). The specification also clearly discloses the treatment of *Staph.* infections *in humans*. See, for example, page 1, lines 18-21, page 6, lines 36-39 and page 23, lines 22-24 as well as original Claims 13 and 29.

In order to satisfy the written description requirement, a patent specification must describe the claimed invention *in sufficient detail* that one skilled in the art *can reasonably conclude* that the inventor had possession of the claimed invention. Vas-Cath, Inc. v. Mahurkar, 935 F.2d at 1563, 19 USPQ2d at 1111. See MPEP §2163. In view of the above, it is respectfully submitted that the specification clearly conveys to one skilled in the art that the applicants had possession of the claimed invention [i.e., the administration of <50 mg/kg doses of lysostaphin analogue(s) administered in multiple doses per day to humans]. Accordingly, reconsideration and withdrawal of the rejections of Claims 4, 5, 32 and 41-60 is respectfully requested.

Claims 4, 5, 32 and 41-60 were rejected under 35 U.S.C. 103(a) as allegedly being obvious over Zygmunt and Goldberg and Stark, and further in view of Oldham. This rejection, which appears on page 3, paragraph 3 of the Official Action, is respectfully traversed for the following reasons.

First, as acknowledged in the Official Action, neither Goldberg nor Zygmunt disclose specific treatment regimens *for humans*. Rather, Goldberg is directed to the treatment of dogs and Zygmunt to the treatment of mice. Further, Claims 4 and 5 as amended are directed to methods of treating an established staphylococcal infection in humans. In Zygmunt, the

lysostaphin is administered to mice one hour post infection (see page 319 of Zygmunt). Accordingly, the infections being treated in Zygmunt are not established infections. In fact, studies on established infections in mice showed that lysostaphin administered in single doses of approximately 100 and 200 mg/kg failed to clear the established infections from the kidneys. See Dixon, Yale Journal of Biology and Medicine, Vol. 41, August 1968, pp. 64 and 65 and Schaffner, Yale Journal of Biology and Medicine, Vol. 39, February 1967, pp. 235-237.[1] Accordingly, it is respectfully submitted that one of ordinary skill in the art at the time the invention was made would not have been motivated to employ a treatment regimen for humans as set forth in Claims 4 and 5 in view of the teachings of Zygmunt.

Goldberg also fails to provide the requisite motivation. In particular, none of the dogs that recovered in the Goldberg study received doses of lysostaphin in the claimed range (i.e., in an amount of no more than 30 mg/kg/day). The doses administered in Goldberg are set forth below in Table I for the "well" and "improved" dogs:

Table I: Well Dogs and Improved Dogs

Group	No. Doses	Mean Dose (mg/kg)	No. Days Treated	Amount (mg/kg/day)	Total Amount (mg/kg)
1	7	38	4	66.5	266
2	7	45	4.2	75	315
3	1	50	----	50	50
4	23	10	6.5	35.4	230
5	7	14	3.1	31.6	98
11	1	50	—	50	50
12	1	50	—	50	50
13	13	20	1.4	186.0	260

[1] Dixon was cited by the examiner in the last Official Action. A copy of Schaffner, which has previously been made of record, is attached hereto.

As can be seen from the above table, the dogs that were considered "well" or "improved" in the Goldberg study received doses ranging from 31.6 to 186.0 mg/kg/day.

Further, as can be seen from Table II, below, all of the dogs that received doses of lysostaphin within the claimed range (i.e., in an amount no more than 30 mg/kg/day) in the Goldberg study relapsed.

Table II: Relapsed Dogs

Group	No. Doses	Mean Dose (mg/kg)	No. Days Treated	Amount (mg/kg/day)	Total Amount (mg/kg)
6	12	9.5	2.0	57	114
7	**8**	**5.5**	**2.5**	**17.6**	**44**
8	5	47	1.5	157	235
9	1	50	—	50	50
10	**13**	**5**	**5.0**	**13**	**65**

In particular, the Groups 7 and 10 dogs received 17.6 and 13 mg/kg/day of lysostaphin, respectively. Further, the group 7 dog in Goldberg had 10^8 colonies/g of bacteria in heart valve cultures and 3,775 colonies/ml of bacteria in blood cultures prior to autopsy (see Table 1 of Goldberg). The group 10 dog was not tested for bacteria in heart valve cultures but had 280 colonies/ml of bacteria in blood cultures prior to autopsy (see Table 1 of Goldberg). In contrast, dogs in the well dogs" and "improved dogs" groups had no more than 40 colonies/ml in blood cultures prior to autopsy and no more than 104 colonies/g in heart valve cultures (see Table 1 of Goldberg).

In view of the above, it is respectfully submitted that one of ordinary skill in the art at the time the invention was made would not have been motivated to employ a treatment regimen for humans as set forth in Claims 4 and 5 in view of the teachings of Goldberg and/or Zygmunt. In fact, as clearly set forth above, Goldberg teaches away from the claimed treatment regimen. As

set forth in the MPEP, "[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). As set forth above, both of the dogs administered lysostaphin in a daily dosage range as set forth in Claims 4 and 5 (i.e., no more than 30 mg/kg/day) relapsed (see page 48 of Goldberg). In contrast, the majority of the dogs (i.e., 8 of 11) that were administered lysostaphin in a daily dosage outside of the range set forth in Claims 4 and 5 either improved or recovered. In view of the above, it is respectfully submitted that, taken as a whole, Goldberg would lead one of ordinary skill in the art away from the claimed treatment regimen.

Stark fails to remedy the above noted deficiencies of Zygmunt and Goldberg. In particular, as acknowledged in the Official Action, Stark discloses the administration of only a single 500 mg does of lysostaphin to a human. There is no teaching or suggestion in Stark of a treatment regimen as set forth in Claims 4 or 5. Accordingly, it is respectfully submitted that the combination of Stark, Zygmunt and Goldberg fails to teach or reasonably suggest the claimed invention.

Oldham does not remedy the above noted deficiencies of Zygmunt, Goldberg and Stark. In particular, Oldham is merely being relied upon in the Official Action to show that lysostaphin can be produced recombinantly (page 6 of the Official Action).

The Official Action states that "[i]n regard to multiple administration to humans, as Goldberg teaches that lysostaphin is effective in animal studies when taken either in a single dose or repetitively, *it would be obvious to select an appropriate regime* of administration in humans as well" (emphasis added, page 5 of the Official Action). Claims 4 and 5, however, are directed to specific treatment regimens for humans (i.e., systemic administration of multiple doses of a lysostaphin analogue in an amount of no more than 30 mg/kg/day) and not to "an appropriate

regime of administration in humans" generally. Further, as set forth above, it is respectfully submitted that the disclosure of specific doses and treatment regimens for dogs (Goldberg) and mice (Zygmunt), when combined with the disclosure in Stark of administration of a single dose of lysostaphin to a human, does not teach or reasonably suggest a method as claimed comprising *systemic administration to a human of multiple doses of a lysostaphin analogue wherein the amount of lysostaphin analogue administered is no more than 30 mg/kg/day.*

The Official Action also states that "[a]bsent some teaching to the contrary, determination of particular ranges employed is within the skill of the ordinary worker as a part of the process of normal optimization" (page 6 of the Official Action). Although it is not inventive to discover optimum or workable ranges by routine experimentation *where the general conditions of a claim are disclosed in the prior art* [see, for example, In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05(II)(A)], it is respectfully submitted that the references cited in the Official Action, either alone or in combination, fail to disclose the "general conditions" of the claimed invention. In particular, the references of record fail to teach or reasonably suggest the systemic administration to a human of multiple doses per day of a lysostaphin analogue wherein the amount of lysostaphin analogue administered is no more than 30 mg/kg/day.

There is also objective evidence of non-obviousness in the specification which further distinguishes the claimed invention from the references cited in the Official Action. In particular, as shown in Table 6 of the specification (page 21), a method of treating a staphylococcal infection as claimed resulted in a statistically significant reduction in the number of viable bacteria present in the aortas of rabbits having established endocarditis infections. Further, the experiment using a treatment within the scope of the claims resulted in complete sterilization of the heart valve vegetation in all but one (i.e., in 10 of 11) of the rabbits tested. In contrast, a

separate trial employing a single daily dose of lysostaphin resulted in complete sterilization of the heart valve vegetation in only 2 of 10 rabbits tested. Further, even when lysostaphin was administered once a day in combination with vancomycin twice daily, only 3 of 11 rabbits tested showed complete sterilization of the heart valve vegetation.

According to the MPEP, objective evidence of non-obviousness must be considered whenever present. See MPEP § 716.01(a). As also set forth in the MPEP, "[e]xaminers must consider comparative data in the specification which is intended to illustrate the claimed invention in reaching a conclusion with regard to the obviousness of the claims. In re Margolis, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986)." See MPEP § 716.01(a). It is respectfully submitted that the aforementioned evidence of non-obviousness presented in the specification further distinguishes the claimed invention from the references of record.

Claims 32, 41-51 and 56-60 depend either directly or indirectly from Claims 4 or 5 and are therefore also patentable for at least the reasons set forth above with respect to Claims 4 and 5. Accordingly, it is respectfully requested that the rejection of Claims 32, 41-51 and 56-60 be reconsidered and withdrawn.

Additionally, Claims 56 and 59 can be further distinguished from the references of record. Claims 56 and 59 depend from Claims 32 and 58, respectively, and further recite that the at least one lysostaphin analogue is administered simultaneously with a second antimicrobial agent. There is no teaching or suggestion in any of the references cited in the Official Action of a method as set forth in Claims 56 or 59 comprising simultaneous systemic administration of Lysostaphin and a second antibiotic to a human suffering from a staph infection.

Claims 32, 42, 43, 46, 47, 50, 51, 54 and 55 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zygmunt and Goldberg and Stark, and Oldham as applied above, and

further in view of Dixon. This rejection, which appears on pages 8-9, paragraph 4 of the Official Action, is respectfully traversed for the following reasons.

As set forth above, Zygmunt and Goldberg and Stark, and Oldham fail to teach or reasonably suggest the method as set forth in Claims 4 or 5. Claims 32 and 58 depend from Claims 4 and 5, respectively, and further recite administering a second antimicrobial agent selected from the group consisting of rifamycin, a glycopeptide, and combinations thereof. Dixon, however, is merely being relied upon for teaching the use of lysostaphin in combination with other anti-microbials. Claims 32 and 58 are therefore patentable over the cited references for at least the reasons set forth above with respect to Claims 4 and 5, respectively. Claims 42, 46, 50, 54 and 56 depend from Claim 32. Claims 43, 47, 51 and 59 depend from Claim 58. These claims are therefore also patentable over the cited references for at least the reasons set forth above with respect to Claims 32 and 58.

CONCLUSION

All rejections having been addressed by the present amendments and response, Applicants believe that the present case is in condition for allowance and respectfully request early notice to that effect. If any issues remain to be addressed in this matter which might be resolved by discussion, the Examiner is respectfully requested to call Applicants' undersigned counsel at the number indicated below.

Respectfully submitted,

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MARKED-UP COPY OF AMENDED CLAIMS

4. (Four Times Amended) A method of treating [a] an established staphylococcal infection of at least one organ or tissue selected from the group consisting of heart valve, blood, kidney, lung, bone and meninges, comprising systemically administering to a human suffering from at least one of said infections an effective amount of at least one recombinantly produced lysostaphin analogue;

wherein multiple doses [per day] of the lysostaphin analogue are administered [in an amount of 50 mg/kg or less per dose] and wherein the amount of lysostaphin analogue(s) administered is no more than 30 mg/kg/day.

5. (Four Times Amended) A method of treating [a] an established infection associated with a catheter or a prosthetic device, comprising systemically administering to a human suffering from such an infection an effective amount of at least one recombinantly produced lysostaphin analogue;

wherein multiple doses [per day] of the lysostaphin analogue are administered [in an amount of 50 mg/kg or less per dose] and wherein the amount of lysostaphin analogue(s) administered is no more than 30 mg/kg/day.

41. (Twice Amended) The method of Claim 5, wherein the amount of lysostaphin analogue(s) administered is [between] 0.5 mg/kg/day [and 200 mg/kg/day] or more.

42. (Twice Amended) The method of Claim 32, wherein the amount of lysostaphin analogue(s) administered is [between] 0.5 mg/kg/day [and 200 mg/kg/day] or more.

43. (Twice Amended) The method of Claim 58, wherein the amount of lysostaphin analogue(s) administered is [between] 0.5 mg/kg/day [and 200 mg/kg/day] or more.

44. (Twice Amended) The method of Claim 4, wherein the amount of lysostaphin analogue(s) administered is [between 3 mg/kg/day and 50] no more than 25 mg/kg/day.

45. (Twice Amended) The method of Claim 5, wherein the amount of lysostaphin analogue(s) administered is [between 3 mg/kg/day and 50] no more than 25 mg/kg/day.

46. (Twice Amended) The method of Claim 32, wherein the amount of lysostaphin analogue(s) administered is [between 3 mg/kg/day and 50] no more than 25 mg/kg/day.

47. (Twice Amended) The method of Claim 58, wherein the amount of lysostaphin analogue(s) administered is [between 3 mg/kg/day and 50] no more than 25 mg/kg/day.

60. (Amended) The method of Claim 4, wherein the amount of lysostaphin analogue(s) administered is [between] 0.5 mg/kg/day [and 200 mg/kg/day] or more.

FULL TEXT OF CASES (USPQ2D)
All Other Cases
Vas-Cath Inc. v. Mahurkar (CA FC) 19 USPQ2d 1111 (6/7/1991)

Vas-Cath Inc. v. Mahurkar (CA FC) 19 USPQ2d 1111

Vas-Cath Inc. v. Mahurkar

U.S. Court of Appeals Federal Circuit
19 USPQ2d 1111

Decided June 7, 1991
Nos. 90-1528, 91-1032

Headnotes

JUDICIAL PRACTICE AND PROCEDURE

1. Procedure - Summary judgment - In general (§ 410.3301)

Procedure - Judicial review - Standard of review - In general (§ 410.4607.01)

Court of appeals, in reviewing grant of summary judgment, is not bound by federal district court's holding that no material facts are in dispute, and must make independent determination as to whether standards for summary judgment have been met.

PATENTS

2. Patentability/Validity - Specification - Written description (§ 115.1103)

"Written description" of invention required by first paragraph of 35 USC 112 is separate and distinct from that paragraph's requirement of enabling disclosure, since description must do more than merely provide explanation of how to "make and use" invention; applicant must also convey, with reasonable clarity to those skilled in art, that applicant, as of filing date sought, was in possession of invention, with invention being, for purposes of "written description" inquiry, whatever is presently claimed.

3. Practice and procedure in Patent and Trademark Office - Prosecution - Drawings _ (§ 110.0920)

Patentability/Validity - Specification - Written description _ (§ 115.1103)

Drawings alone may, under proper circumstances, provide "written description" of invention required by 35 USC 112, and whether drawings are from design application or utility application is not determinative.

4. Patentability/Validity - Specification - Written description _ (§ 115.1103)

Federal district court erred by requiring drawings from design patent application to "describe what is novel or important" about invention in order to satisfy "written description" requirement of 35 USC 112 for later-filed utility patent on double lumen catheter having combination of features, since there is no legally cognizable or protected "essential" element, "gist" or "heart" of invention in combination patent; rather, invention is defined by claims under consideration.

5. Patentability/Validity - Specification -Written description _ (§ 115.1103)

Federal district court erred by considering patents granted to applicant after utility patents containing claims in question in determining whether drawings from design application satisfy "written description" requirement of 35 USC 112 for those claims, since later patenting of inventions having different specifications is irrelevant to determination of Section 112 sufficiency of application in question, which must be judged as of its filing date.

6. Patentability/Validity - Specification - Written description _ (§ 115.1103)

Federal district court erred by imposing legal standard that essentially required drawings from design application for double lumen catheter to necessarily exclude all diameters of lumens, other than those within range specified by subsequently-filed utility claims, in order to satisfy "written description" requirement of 35 USC 112 for those claims, since proper test is whether drawings conveyed, with reasonable clarity to those of ordinary skill in art, that applicant had in fact invented catheter having return lumen of diameter within claimed range; defendant's submission of expert's declaration stating that person of ordinary skill viewing drawings would be able to derive claimed range therefrom, and plaintiff's failure to refute such declaration, therefore gave rise to genuine issue of material fact inappropriate for summary disposition.

Particular patents - General and mechanical - Catheters

4,568,329, Mahurkar, double lumen catheter, summary judgment of invalidity reversed.
4,692,141, Mahurkar, double lumen catheter, summary judgment of invalidity reversed.

Case History and Disposition:

Appeal from the U.S. District Court for the Northern District of Illinois, Easterbrook, J.; 17 USPQ2d 1353 .

Action by Vas-Cath Inc. and Gambro Inc. against Sakharam D. Mahurkar and Quinton Instruments Co., for declaratory judgment of patent non-infringement, in which defendants counterclaim for patent infringement. From entry of summary judgment holding patents invalid, defendants appeal. Reversed and remanded.

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Judge:
Before Rich, Michel, and Plager, circuit judges.

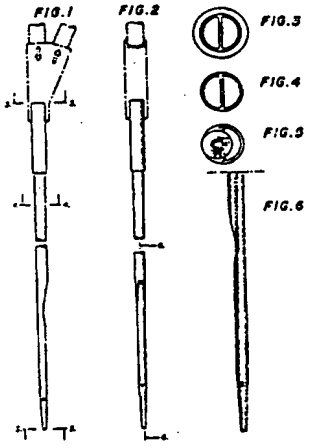
Opinion Text

Opinion By:
Rich, J.

Sakharam D. Mahurkar and Quinton Instruments Company (collectively Mahurkar) appeal from the September 12, 1990 partial final judgment 1 of the United States District Court for the Northern District of Illinois, Easterbrook, J., sitting by designation, in Case No. 88 C 4997. Granting partial summary judgment to Vas-Cath Incorporated and its licensee Gambro, Inc. (collectively Vas-Cath), the district court declared Mahurkar's two United States utility patents Nos. 4,568,329 ('329 patent) and 4,692,141 ('141 patent), titled "Double Lumen Catheter," invalid as anticipated under 35 USC 102(b). In reaching its decision, reported at 745 F.Supp. 517, 17 USPQ2d 1353 , the district court concluded that none of the twenty-one claims of the two utility patents was entitled, under 35 USC 120, to the benefit of the filing date of Mahurkar's earlier-filed United States design patent application Serial No. 356,081 ('081 design application), which comprised the same drawings as the utility patents, because the design application did not provide a "written description of the invention" as required by 35 USC 112, first paragraph. We *reverse* the grant of summary judgment with respect to all claims.

BACKGROUND

Sakharam Mahurkar filed the '081 design application, also titled "Double Lumen Catheter," on March 8, 1982. The application was abandoned on November 30, 1984. Figures 1-6 of the '081 design application are reproduced at right [below].



As shown, Mahurkar's catheter comprises a pair of tubes (lumens) designed to allow blood to be

removed from an artery, processed in an apparatus that removes impurities, and returned close to the place of removal. Prior art catheters utilized concentric circular lumens, while Mahurkar's employs joined semi-circular tubes that come to a single tapered tip. Advantageously, the puncture area of Mahurkar's semicircular catheter is 42% less than that of a coaxial catheter carrying the same quantity of blood, and its conical tip yields low rates of injury to the blood. The prior art coaxial catheters are now obsolete; Mahurkar's catheters appear to represent more than half of the world's sales. 745 F.Supp. at 520, 17 USPQ2d at 1353-54.

After filing the '081 design application, Mahurkar also filed a Canadian Industrial Design application comprising the same

drawings plus additional textual description. On August 9, 1982, Canadian Industrial Design 50,089 (Canadian '089) issued on that application.

More than one year later, on October 1, 1984, Mahurkar filed the first of two utility patent applications that would give rise to the patents now on appeal. Notably, both utility applications included the same drawings as the '081 design application. 2 Serial No. 656,601 ('601 utility application) claimed the benefit of the filing date of the '081 design application, having been denominated a "continuation" thereof. In an Office Action mailed June 6, 1985, the Patent and Trademark Office (PTO) examiner noted that "the prior application is a design application," but did not dispute that the '601 application was entitled to its filing date. On January 29, 1986, Mahurkar filed Serial No. 823,592 ('592 utility application), again claiming the benefit of the filing date of the '081 design application (the '592 utility application was denominated a continuation of the '601 utility application). In an office action mailed April 1, 1987, the examiner stated that the '592 utility application was "considered to be fully supported by applicant's parent application SN 356,081 filed March 8, 1982 [the '081 design application]." The '601 and '592 utility applications issued in 1986 and 1987, respectively, as the '329 and '141 patents, the subjects of this appeal. The independent claims of both patents are set forth in the Appendix hereto.

Vas-Cath sued Mahurkar in June 1988, seeking a declaratory judgment that the catheters it manufactured did not infringe Mahurkar's '329 and '141 utility patents. 3 Vas-Cath's complaint alleged, inter alia, that the '329 and '141 patents were both invalid as anticipated under 35 USC 102 (b) by Canadian '089. Vas-Cath's anticipation theory was premised on the argument that the '329 and '141 patents were not entitled under 35 USC 120 4 to the filing date of the '081 design application because its drawings did not provide an adequate "written description" of the claimed invention as required by 35 USC 112, first paragraph.

Mahurkar counterclaimed, alleging infringement. Both parties moved for summary judgment on certain issues, including validity. For purposes of the summary judgment motion, Mahurkar conceded that, if he could not antedate it, Canadian '089 would represent an enabling and thus anticipating §102(b) reference against the claims of his '329 and '141 utility patents. 745 F.Supp. at 521, 17 USPQ2d at 1355. Vas-Cath conceded that the '081 design drawings *enabled* one skilled in the art to practice the claimed invention within the meaning of 35 USC 112, first paragraph. *Id.* Thus, the question before the district court was whether the disclosure of the '081 design application, namely, the drawings without more, adequately meets the "written description" requirement also contained in §112, first paragraph, so as to entitle Mahurkar to the benefit of the 1982 filing date of the '081 design application for his two utility patents and thereby antedates Canadian '089. Concluding that the drawings do not do so, and that therefore the utility patents are anticipated by Canadian '089, the district court held the '329 and '141 patents wholly invalid under 35 USC 102(b), *id.* at 524, 17 USPQ2d at 1358, and subsequently granted Mahurkar's motion for entry of a partial final judgment under Fed.R.Civ.P. 54(b) on the validity issue. This appeal followed.

DISCUSSION

The issue before us is whether the district court erred in concluding, on summary judgment, that the disclosure of the '081 design application does not provide a §112, first paragraph "written description" adequate to support each of the claims of the '329 and '141 patents. If the court so erred as to any of the 21 claims at issue, the admittedly anticipatory disclosure of Canadian '089 will have

been antedated (and the basis for the court's

grant of summary judgment nullified) as to those claims.

[1] In reviewing the district court's grant of summary judgment, we are not bound by its holding that no material facts are in dispute, and must make an independent determination as to whether the standards for summary judgment have been met. *C.R. Bard, Inc. v. Advanced Cardiovascular Systems,* 911 F.2d 670, 673, 15 USPQ2d 1540, 1542-43 (Fed. Cir. 1990). Summary judgment will not lie if the dispute about a material fact is "genuine," that is, if the evidence is such that a reasonable jury could return a verdict for the nonmoving party. *Anderson v. Liberty Lobby, Inc.,* 477 U.S. 242, 248 (1986).

The "Written Description" Requirement of §112

The first paragraph of 35 USC 112 requires that

he specification shall contain *a written description of the invention,* and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(Emphasis added). Application of the "written description" requirement, derived from the portion of §112 emphasized above, is central to resolution of this appeal. The district court, having reviewed this court's decisions on the subject, remarked that "[u]nfortunately, it is not so easy to tell what the law of the Federal Circuit is." 745 F.Supp. at 522, 17 USPQ2d at 1356. Perhaps that is so, and, therefore, before proceeding to the merits, we review the case law development of the "written description" requirement with a view to improving the situation. 5

The cases indicate that the "written description" requirement most often comes into play where claims not presented in the application when filed are presented thereafter. Alternatively, patent applicants often seek the benefit of the filing date of an earlier-filed foreign or United States application under 35 USC 119 or 35 USC 120, respectively, for claims of a later-filed application. The question raised by these situations is most often phrased as whether the application provides "adequate support" for the claim(s) at issue; it has also been analyzed in terms of "new matter" under 35 USC 132. The "written description" question similarly arises in the interference context, where the issue is whether the specification of one party to the interference can support the claim(s) corresponding to the count(s) at issue, i.e., whether that party "can make the claim" corresponding to the interference count.

To the uninitiated, it may seem anomalous that the first paragraph of 35 USC 112 has been interpreted as requiring a separate "description of the invention," when the invention is, necessarily, the subject matter defined in the *claims* under consideration. *See In re Wright,* 866 F.2d 422, 424, 9 USPQ2d 1649, 1851 (Fed. Cir. 1989). One may wonder what purpose a separate "written description" requirement serves, when the second paragraph of §112 expressly requires that the applicant conclude his specification "with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

One explanation is historical: the "written description" requirement was a part of the patent statutes at a time *before* claims were required. A case in point is *Evans v. Eaton,* 20 U.S. (7 Wheat.) 356 (1822), in which the Supreme Court affirmed the circuit court's decision that the plaintiff's patent was "deficient," and that the plaintiff could not recover for infringement thereunder. The patent laws then in effect, namely the Patent Act of 1793, did not require claims, but did require, in its 3d section, that the patent applicant "deliver a written description of his invention, and of the manner of using, or process of compounding, the same, in such full, clear and exact terms, as to distinguish the same from all things before known, and to enable any person skilled in the art or science of which it is a branch, or with which it is most nearly connected, to make, compound and use the same...." *Id.* at 430. In view of this language, the Court concluded that the specification of a patent had two objects, the first of which was "to enable artizans to make and use [the invention]. ..." *Id.* at 433. The second object of the specification was

to put the public in possession of what the party claims as his own invention, so as to ascertain if he

claims anything that is in common use, or is already known, and to guard against prejudice or injury from the use of an invention which the party may otherwise innocently suppose not to be

patented. It is, therefore, for the purpose of warning an innocent purchaser, or other person using a machine, of his infringement of the patent; and at the same time, of taking from the inventor the means of practising upon the credulity or the fears of other persons, by pretending that his invention is more than what it really is, or different from its ostensible objects, that the patentee is required to distinguish his invention in his specification.

Id. at 434.

A second, policy-based rationale for the inclusion in §112 of both the first paragraph "written description" and the second paragraph "definiteness" requirements was set forth in *Rengo Co. v. Molins Mach. Co.,* 657 F.2d 535, 551, 211 USPQ 303, 321 (3d Cir.), *cert. denied,* 454 U.S. 1055 (1981):

here is a subtle relationship between the policies underlying the description and definiteness requirements, as the two standards, while complementary, approach a similar problem from different directions. Adequate description of the invention guards against the inventor's overreaching by insisting that he recount his invention in such detail that his future claims can be determined to be encompassed within his original creation. The definiteness requirement shapes the future conduct of persons other than the inventor, by insisting that they receive notice of the scope of the patented device.

With respect to the first paragraph of §112 the severability of its "written description" provision from its enablement ("make and use") provision was recognized by this court's predecessor, the Court of Customs and Patent Appeals, as early as *In re Ruschig,* 379 F.2d 990, 154 USPQ 118 (CCPA 1967). Although the appellants in that case had presumed that the rejection appealed from was based on the enablement requirement of §112, *id.* at 995, 154 USPQ at 123, the court disagreed:

he question is not whether [one skilled in the art] would be so enabled but whether the specification discloses the compound to him, specifically, *as something appellants actually invented.* ... If [the rejection is] based on section 112, it is on the requirement thereof that "The specification shall contain a written description *of the invention* * * *." (Emphasis ours.)

Id. at 995-96, 154 USPQ at 123 (first emphasis added). The issue, as the court saw it, was one of fact: "Does the specification convey clearly to those skilled in the art, to whom it is addressed, in any way, the information that appellants invented that specific compound [claimed]?" *Id.* at 996, 154 USPQ at 123.

In a 1971 case again involving chemical subject matter, the court expressly stated that "it is possible for a specification to *enable* the practice of an invention as broadly as it is claimed, and still not *describe* that invention." *In re DiLeone,* 436 F.2d 1404, 1405, 168 USPQ 592, 593 (CCPA 1971) (emphasis added). As an example, the court posited the situation "where the specification discusses *only* compound A and contains *no* broadening language of any kind. This might very well enable one skilled in the art to make and use compounds B and C; yet the class consisting of A, B and C has not been described." *Id.* at 1405 n.1, 168 USPQ 593 n.1 (emphases in original). *See also In re Ahlbrecht,* 435 F.2d 908, 911, 168 USPQ 293, 296 (CCPA 1971) (although disclosure of parent application may have *enabled* production of claimed esters having 2-12 methylene groups, it only *described* esters having 3-12 methylene groups).

The CCPA also recognized a subtle distinction between a written description adequate to *support* a claim under §112 and a written description sufficient to *anticipate* its subject matter under §102(b). The difference between "claim-supporting disclosures" and "claim-anticipating disclosures" was dispositive in *In re Lukach,* 442 F.2d 967, 169 USPQ 795 (CCPA 1971), where the court held that a U.S. "grandparent" application did not sufficiently describe the later-claimed invention, but that the appellant's intervening British application, a counterpart to the U.S. application, anticipated the claimed subject matter. As the court pointed out, "the description of a single embodiment of broadly claimed subject matter constitutes a description of the invention for anticipation purposes ..., whereas the same information in a specification might not alone be enough to provide a description of that invention for purposes of adequate disclosure...." *Id.* at 970, 169 USPQ at 797 (citations omitted).

The purpose and applicability of the "written description" requirement were addressed in *In re Smith and Hubin,* 481 F.2d 910, 178 USPQ 620 (CCPA 1973), where the court stated:
Satisfaction of the description requirement insures that subject matter presented in the form of a claim subsequent to the filing date of the application was sufficiently disclosed at the time of filing so that the prima facie date of invention can fairly be held to be the filing date of the application. This concept applies whether

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the case factually arises out of an assertion of entitlement to the filing date of a previously filed application under §120 ... or arises in the interference context wherein the issue is support for a count in the specification of one or more of the parties ... or arises in an ex parte case involving a single application, but where the claim at issue was filed subsequent to the filing of the application....
Id. at 914, 178 USPQ at 623-24 (citations omitted).
The CCPA's "written description" cases often stressed the fact-specificity of the issue. *See, e.g., In re Wertheim,* 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976) ("The primary consideration is *factual* and depends on the nature of the invention and the amount of knowledge imparted to those skilled in the art by the disclosure") (emphasis in original); *In re Smith,* 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972) ("Precisely how close the description must come to comply with §112 must be left to case-by-case development"); *DiLeone,* 438 F.2d at 1405, 168 USPQ at 593 ("What is needed to meet the description requirement will necessarily vary depending on the nature of the invention claimed"). The court even went so far as to state:
t should be readily apparent from recent decisions of this court involving the question of compliance with the description requirement of §112 that each case must be decided on its own facts. Thus, the precedential value of cases in this area is extremely limited.
In re Driscoll, 562 F.2d 1245, 1250, 195 USPQ 434, 438 (CCPA 1977).
Since its inception, the Court of Appeals for the Federal Circuit has frequently addressed the "written description" requirement of §112. 6 A fairly uniform standard for determining compliance with the "written description" requirement has been maintained throughout: "Although [the applicant] does not have to describe exactly the subject matter claimed, ... the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." *In re Gosteli,* 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (citations omitted). "[T]he test for sufficiency of support in a parent application is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.'" *Ralston Purina Co. v. Far-Mar-Co, Inc.,* 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow,* 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). Our cases also provide that compliance with the "written description" requirement of §112 is a question of fact, to be reviewed under the clearly erroneous standard. *Gosteli,* 872 F.2d at 1012, 10 USPQ2d at 1618; *Utter v. Hiraga,* 845 F.2d 993, 998, 6 USPQ2d 1709, 1714 (Fed. Cir. 1988).
There appears to be some confusion in our decisions concerning the extent to which the "written description" requirement is separate and distinct from the enablement requirement. For example, in *In re Wilder,* 736

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F.2d 1516, 1520, 222 USPQ 369, 372 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 1209 (1985), we flatly stated: "The description requirement is found in 35 U.S.C. §112 and is separate from the enablement requirement of that provision." However, in a later case we said, "The purpose of the [written] description requirement [of section 112, first paragraph] is to state what is needed to fulfill the enablement criteria. These requirements may be viewed separately, but they are intertwined." *Kennecott Corp. v. Kyocera Int'l, Inc.,* 835 F.2d 1419, 1421, 5 USPQ2d 1194, 1197 (Fed. Cir. 1987), *cert. denied,* 486 U.S. 1008 (1988). "The written description must communicate that which is needed to enable the skilled artisan to make and use the claimed invention." *Id.*
[2] To the extent that *Kennecott* conflicts with *Wilder,* we note that decisions of a three-judge panel of this court cannot overturn prior precedential decisions. *See UMC Elec. Co. v. United States,* 816

F.2d 647, 652 n.6, 2 USPQ2d 1465 , 1468 n.7 (Fed. Cir. 1987), *cert. denied,* 484 U.S. 1025 (1988). This court in *Wilder* (and the CCPA before it) clearly recognized, and we hereby reaffirm, that 35 USC 112, first paragraph, requires a "written description of the invention" which is separate and distinct from the enablement requirement. The purpose of the "written description" requirement is broader than to merely explain how to "make and use"; the applicant must also convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention.* The invention is, for purposes of the "written description" inquiry, *whatever is now claimed.*

The District Court's Analysis

We agree with the district court's conclusion that drawings alone *may* be sufficient to provide the "written description of the invention" required by §112, first paragraph. Several earlier cases, not specifically framing the issue in terms of compliance with the "written description" requirement, support this conclusion.

For example, we previously stated that "[t]here is no statutory prohibition against an applicant's reliance, in claiming priority under 35 U.S.C. §120, on a disclosure in a design application if the statutory conditions are met." *KangaROOS U.S.A., Inc. v. Caldor, Inc.,* 778 F.2d 1571, 1574, 228 USPQ 32, 33 (Fed. Cir. 1985). The question whether the applicant's claim to a pocket for athletic shoes was in fact entitled to the filing date of his earlier design application was not resolved in *KangaROOS,* however. Issues of intent to deceive the PTO were involved, as well as an error of law by the district court in construing the claims of the wrong application. *Id.* at 1574-75, 228 USPQ at 34-35. The district court's grant of partial summary judgment of inequitable conduct was vacated and the case remanded for trial.

In re Berkman, 642 F.2d 427, 209 USPQ 45 (CCPA 1981) involved a claim under 35 USC 120 to benefit of the filing date of two earlier design patent applications that included drawings of a carrying and storage case for tape cartridges and cassettes. The invention claimed in the later-filed utility application was an "insert" of "compartmented form," adapted for use in the interior of the storage case. *Id.* at 429, 209 USPQ at 47. The court characterized the dispositive issue as "whether the design applications sufficiently disclose the invention now claimed in the ... utility application at bar." *Id.* at 429, 209 USPQ at 46. While specifically recognizing that "drawings may be used to satisfy the disclosure requirement," *id.* at 429, 209 USPQ at 46-47, the court held that Berkman's design applications "fail[ed] to disclose the claimed invention sufficiently to comply with the requirements of §112 first paragraph." As the court explained:

Nowhere in the design applications is the word "insert" used, nor is there any indication that the interiors of the cases are inserts. The drawings do not disclose how the insert can be used to accommodate either cassette or cartridge type tape enclosures. Berkman argues that one skilled in the art would readily recognize that the interiors of the cases illustrated in the design drawings are inserts. We do not agree. There is nothing shown in the drawings to lead one of ordinary skill to such a conclusion.

Id. at 430, 209 USPQ at 47.

The issue in *In re Wolfensperger,* 302 F.2d 950, 133 USPQ 537 (CCPA 1962) was whether the specification of the applicant's utility patent application disclosing a ball valve, and particularly the drawings thereof, supported a claim limitation that read: "having, in untensioned condition, a mean diameter corresponding approximately to the mean diameter of said chamber and a radial width smaller than the radial width of said chamber...." *Id.* at 952, 133 USPQ at 538. The court did not agree with the Board's conclusion that the "radial width" relationship was not supported by applicant's figure 5:

The board's statement that "drawings alone cannot form the basis of a valid claim" is too broad a generalization to be valid and is, furthermore, contrary to well

settled and long-established Patent Office practice.... Consider, for one thing, that the sole disclosure in a design patent application is by means of a drawing. ... For another thing, consider that the only informative and significant disclosure in many electrical and chemical patents is by means of circuit

diagrams or graphic formulae, constituting "drawings" in the case....
... The practical, legitimate enquiry in each case of this kind is what the drawing in fact discloses to one skilled in the art. ...
... The issue here is whether there is supporting "disclosure" and it does not seem, under established procedure of long standing, approved by this court, to be of any legal significance whether the disclosure is found in the specification or in the drawings so long as it is there.
Id. at 955-56, 133 USPQ at 541-42.
Employing a "new matter" analysis, the court in *In re Heinle,* 342 F.2d 1001, 145 USPQ 131 (CCPA 1965) reversed a PTO rejection of the applicant's claims to a "toilet paper core" as "including subject matter having no clear basis in the application as filed." *Id.* at 1003, 145 USPQ at 133. The claim limitation said to be without support required that the width of the apertures in the core be "approximately one-fourth of the circumference of said core." *Id.* at 1007, 145 USPQ at 136. Having reviewed the application drawings relied upon for support, the court stated:
it seems to us that [the drawings] conform to the one-fourth circumference limitation almost exactly. But the claim requires only an approximation. Since we believe an amendment to the specification to state that one-fourth of the circumference is the aperture width would not violate the rule against "new matter," we feel that supporting disclosure exists. The rejection is therefore in error.
Id.
[3] These cases support our holding that, under proper circumstances, drawings alone may provide a "written description" of an invention as required by §112. Whether the drawings are those of a design application or a utility application is not determinative, although in most cases the latter are much more detailed. In the instant case, however, the design drawings are substantially identical to the utility application drawings.
Although we join with the district court in concluding that drawings may suffice to satisfy the "written description" requirement of §112, we can not agree with the legal standard that the court imposed for "written description" compliance, nor with the court's conclusion that no genuine issues of material fact were in dispute.
With respect to the former, the district court stated that although the '081 design drawings in question "allowed practice" [i.e., enabled], they did not necessarily
show what the invention is, when "the invention" could be a subset or a superset of the features shown. Is the invention the semi-circular lumens? The conical tip? The ratio at which the tip tapers? The shape, size, and placement of the inlets and outlets? You can measure all of these things from the diagrams in serial '081 and so can practice the device, but you cannot tell, because serial '081 does not say, what combination of these things is "the invention", and what range of variation is allowed without exceeding the scope of the claims. To show one example of an invention, even a working model, is not to describe what is novel or important.
745 F.Supp. at 522, 17 USPQ2d at 1356.
[4] We find the district court's concern with "what the invention is" misplaced, and its requirement that the '081 drawings "describe what is novel or important" legal error. There is "no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention in a combination patent." *Aro Mfg. Co. v. Convertible Top Replacement Co.,* 365 U.S. 336, 345 [128 USPQ 354] (1961). "The invention" is defined by the claims on appeal. The instant claims do not recite *only* a pair of semi-circular lumens, or a conical tip, or a ratio at which the tip tapers, or the shape, size, and placement of the inlets and outlets; they claim *a double lumen catheter* having a *combination* of those features. That combination invention *is* what the '081 drawings show. As the district court itself recognized, "what Mahurkar eventually patented is exactly what the pictures in serial '081 show." 745 F.Supp. at 523, 17 USPQ2d at 1357.
We find the "range of variation" question, much emphasized by the parties, more troublesome. The district court stated that "although Mahurkar's patents use the same diagrams, [the claims] contain limitations that did not follow ineluctably [i.e., inevitably] from the diagrams." *Id.* at 524, 17 USPQ2d at 1357. As an example, the court stated (presumably with respect to independent claims 1 and 7 of the '329 patent) that
the utility patents claim a return lumen that is "substantially greater than one-half but substantially less than a full diameter" after it makes the transition from semi-circular to circular cross-section, and the

drawings of serial '081 fall in this range. But until the utility application was filed, nothing established that they had to - for that matter that the utility patent would claim anything other than the *precise* ratio in the diagrams....

Id. at 523, 17 USPQ2d at 1357. Mahurkar argues that one of ordinary skill in this art, looking at the '081 drawings, would be able to derive the claimed range.

The declaration of Dr. Stephen Ash, submitted by Mahurkar, is directed to these concerns. Dr. Ash, a physician specializing in nephrology (the study of the kidney and its diseases) and chairman of a corporation that develops and manufactures biomedical devices including catheters, explains why one of skill in the art of catheter design and manufacture, studying the drawings of the '081 application in early 1982, would have understood from them that the return lumen must have a diameter within the range recited by independent claims 1 and 7 of the '329 patent. Dr. Ash explains in detail that a return (longer) lumen of diameter less than half that of the two lumens combined would produce too great a pressure increase, while a return lumen of diameter equal or larger than that of the two lumens combined would result in too great a pressure drop. 7 "Ordinary experience with the flow of blood in catheters would lead directly away from any such arrangement," Ash states.

Although the district court found this reasoning "logical," it noted that later patents issued to Mahurkar disclose diameter ratios closer to 1.0 (U.S. Patent No. 4,584,968) and exactly 0.5 (U.S. Des. Patent No. 272,651). If these other ratios were desirable, the district court queried, "how does serial '081 necessarily exclude the[m]?" 745 F.Supp. at 523, 17 USPQ2d at 1357.

[5] The district court erred in taking Mahurkar's other patents into account. Mahurkar's *later* patenting of inventions involving different range limitations is irrelevant to the issue at hand. Application sufficiency under §112, first paragraph, must be judged as of the filing date. *United States Steel Corp. v. Phillips Petroleum Co.,* 865 F.2d 1247, 1251, 9 USPQ2d 1461, 1464 (Fed. Cir. 1989).

[6] The court further erred in applying a legal standard that essentially required the drawings of the '081 design application to *necessarily exclude* all diameters other than those within the claimed range. We question whether any drawing could ever do so. At least with respect to independent claims 1 and 7 of the '329 patent and claims depending therefrom, the proper test is whether the drawings conveyed with reasonable clarity to those of ordinary skill that Mahurkar had in fact invented the catheter recited in those claims, having (among several other limitations) a return lumen diameter substantially less than 1.0 but substantially greater than 0.5 times the diameter of the combined lumens. Consideration of what the drawings conveyed to persons of ordinary skill is essential. *See Ralston Purina,* 772 F.2d at 1575, 227 USPQ at 179 (ranges found in applicant's claims need not correspond *exactly* to those disclosed in parent application; issue is whether one skilled in the art could derive the claimed ranges from parent's disclosure).

Mahurkar submitted the declaration of Dr. Ash on this point; Vas-Cath submitted no technical evidence to refute Ash's conclusions. Although the district court considered Dr. Ash's declaration, we believe its import was improperly disregarded when viewed through the court's erroneous interpretation of the law. 8 We hold that the Ash declaration and Vas-Cath's non-refutation thereof, without more, gave rise to a genuine issue of material fact inappropriate for summary disposition. *See Hesston Corp. v. Sloop,* 1988 U.S. Dist. LEXIS 1573, *13 (D. Kansas) (summary judgment on §112 "written description" issue inappropriate where resolution of what parent disclosure conveyed to those skilled in the art may require examination of experts, demonstrations and exhibits).

Mahurkar urges that at least some of the remaining claims do not contain the range limitations discussed by the district court, and that the presence of range limitations was not a proper basis for invalidating those remaining claims. For example, claim 8 of the '141 patent requires, inter alia, a smooth conical tapered tip and "the portion of said tube between said second opening and said

conical tapered tip *being larger than* said first lumen in the transverse direction normal to the plane of said septum." Vas-Vath counters that claim 8 of the '141 patent is just as much a "range" claim as claims 1 and 7 of the '329 patent, albeit one having only a lower limit and no upper limit. Absent any separate discussion of these remaining claims in the district court's opinion, we assume that the court applied to them the same erroneous legal standard. Summary judgment was therefore inappropriate as to the remaining claims. Additionally, the possibility that the '081 drawings may provide an adequate §112 "written description" of the subject matter of some of the claims but not others should have been considered. *See, e.g., In re Borkowski,* 422 F.2d 904, 909 n.4, 164 USPQ 642 , 646 n.4 (CCPA 1970) (on review of §112 non-enablement rejection: "A disclosure may, of course, be insufficient to support one claim but sufficient to support another.") On remand, the district court should *separately* analyze whether the "written description" requirement has been met as to the subject matter of *each* claim of the '141 and '329 patents.

CONCLUSION

The district court's grant of summary judgment, holding all claims of the '329 and '141 patents invalid under 35 USC 102(b), is hereby reversed as to all claims, and the case remanded for further proceedings consistent herewith.

COSTS

Each party to bear its own costs.

REVERSED* and *REMANDED

APPENDIX

***Independent Claims of the '329 Patent* :**

1. A double lumen catheter having an elongated tube with a proximal first cylindrical portion enclosing first and second lumens separated by an internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening at approximately the distal end of said first cylindrical portion, wherein the improvement comprises: said elongated tube having at its distal end a smooth conical tapered tip that smoothly merges with a second cylindrical portion of said elongated tube, and said second cylindrical portion enclosing the first lumen from the conical tapered tip to approximately the location of said second opening, wherein said second cylindrical portion has a diameter substantially greater than one-half but substantially less than a full diameter of said first cylindrical portion.

7. A double lumen catheter having an elongated tube with a proximal first cylindrical portion enclosing first and second lumens separated by an internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening at approximately the distal end of said first cylindrical portion, wherein the improvement comprises: said elongated tube having at its distal end a smooth conical tapered tip that smoothly merges with a second cylindrical portion of said elongated tube, and said second cylindrical portion enclosing the first lumen from the conical tapered tip to approximately the location of said second opening, said second cylindrical portion having a diameter substantially greater than one-half but substantially less than a full diameter of said first cylindrical portion, said divider in said first cylindrical portion being planar, the lumens being "D" shaped in cross-section in said first cylindrical portion, the elongated tube being provided with a plurality of holes in the region of the conical tapered tip, and said first cylindrical portion of the elongated tube smoothly merging with said second cylindrical portion of the elongated tube.

***Independent Claims of the '141 Patent* :**

1. A double lumen catheter having an elongated tube with a proximal first cylindri

cal portion enclosing first and second lumens separated by an internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening at approximately the distal end of said first cylindrical portion, wherein the improvement comprises: said elongated tube having at its distal end a smooth conical tapered tip that smoothly merges with a second cylindrical portion of said elongated tube, and said second cylindrical portion enclosing the first lumen from the conical tapered tip to approximately the location of said second opening, wherein said second sylindrical [sic] portion has a diameter substantially less than a full diameter of said first cylindrical portion but larger than said first lumen in the transverse direction normal to the plane of said flat divider.

7. A double lumen catheter comprising an elongated cylindrical tube enclosing first and second lumens separated by a flat longitudinal internal divider formed as an integral part of said tube, said tube and said divider forming said first and second lumens as semi-cylindrical cavities within said tube, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, said distal end of said tube forming a smooth conical tapered tip and the second lumen extending from the proximal end of said elongated tube to a second opening spaced a substantial distance away from said first opening toward the proximal end of said tube, the distal end of said divider being joined to the outside wall of said tube distal of said second opening, and the outside wall of said tube forming a smooth transition between said conical tapered tip and the outer circumference of the tube proximal of said second opening, said transition being larger than said first lumen in the transverse direction normal to the plane of said flat divider.

8. A double lumen catheter comprising an elongated cylindrical tube having a longitudinal planar septum of one-piece construction with said tube, said septum dividing the interior of said tube into first and second lumens, said lumens being D-shaped in cross-section, the proximal end of said tube connecting to two separate tubes communicating with the respective first and second lumens for the injection and removal of fluids, the lumen extending from the proximal end of said tube to a first lumen extending from the proximal end of said tube to a first opening at the distal end of said tube, and the second lumen extending from the proximal end of said tube to a second opening axially spaced from the distal end of said tube, said tube having at its distal end a smooth conical tapered tip that merges with the cylindrical surface of said tube, said first lumen, including the internal wall thereof formed by said septum extending continuously through said conical tapered tip, and the portion of said tube between said second opening and said conical tapered tip being larger than said first lumen in the transverse direction normal to the plane of said septum.

13. A double lumen catheter comprising an elongated cylindrical tube enclosing first and second lumens separated by a flat longitudinal internal divider formed as an integral part of said tube, said tube and said divider forming said first and second lumens as semi-cylindrical cavities within said tube, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with he [sic] respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, said distal end of said tube forming a smooth conical tapered tip defining the distal portion of said first lumen and said first opening, said first opening and an adjacent portion of said first lumen having a circular transverse cross-sectional configuration, and the second lumen extending from the proximal end of said elongated tube to a second opening spaced a substantial distance away from said first opening toward the proximal end of said tube, the inside walls of said tube forming a smooth transition between said semicylindrical and circular transverse cross-sectional configurations of said first lumen, the outside dimension of said transition being

larger than said first lumen in the transverse direction normal to the plane of said flat divider.

Footnotes

Footnote 1. The district court directed entry of final judgment as to the issue of patent invalidity pursuant to Fed.R.Civ.P. 54(b).

Footnote 2. The utility patent drawings contain additional but minor shading and lead lines and reference numerals not present in the design application drawings.

Footnote 3. Vas-Cath's apprehension of suit apparently arose from a 1988 Canadian action instituted by Mahurkar for infringement of Canadian '089.

Footnote 4. Section 120, titled "Benefit of Earlier Filing Date in the United States," provides (emphasis ours):

An application for patent for an invention *disclosed in the manner provided by the first paragraph of section 112 of this title* in an application previously filed in the United States, or as provided by section 363 of this title, which is filed by an inventor or inventors named in the previously filed application shall have the same effect as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

Footnote 5. For additional background, *see* Rollins, "35 USC 120 - The Description Requirement," 64 *J. Pat. Off. Soc'y* 656 (1982); Walterscheid, "Insufficient Disclosure Rejections (Part III)," 62 *J. Pat. Off. Soc'y* 261 (1980).

Footnote 6. *See, Chester v. Miller,* 906 F.2d 1574, 15 USPQ2d 1333 (Fed. Cir. 1990) (parent application's disclosure of chemical species constituted 102(b) prior art against continuation-in-part (c-i-p) application on appeal, but did not provide sufficient written description to support c-i-p's claims to encompassing genus); *In re Gostelli,* 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989) (foreign priority application's disclosure of chemical subgenus was insufficient written description to support genus claims of corresponding U.S. application); *In re Wright,* 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) (application in "clear compliance" with §112 "written description" requirement with respect to claim limitation that microcapsules were "not permanently fixed"); *Utter v. Hiraga,* 845 F.2d 993, 998, 6 USPQ2d 1709, 1714 (Fed. Cir. 1988) (holding generic interference count to scroll compressor supported by written description of foreign priority application, the court stated, "A specification may, within the meaning of 35 U.S.C. §112 ¶1, contain a written description of a broadly claimed invention without describing all species that claim encompasses"); *Kennecott Corp. v. Kyocera Int'l, Inc.,* 835 F.2d 1419, 5 USPQ2d 1194 a (Fed. Cir. 1987) (parent application's lack of express disclosure of inherent "equiaxed microstructure" property did not deprive c-i-p's claims to a sintered ceramic body having said property of the benefit of parent's filing date), *cert. denied,* 486 U.S. 1008 (1988); *Ralston Purina Co. v. Far-Mar-Co., Inc.,* 772 F.2d 1570, 227 USPQ 177 (Fed. Cir. 1985) (parent application's disclosure provided adequate written description support for certain claim limitations respecting protein content, temperature, and moisture content, but not others); *In re Wilder,* 736 F.2d 1516, 222 USPQ 369 (Fed. Cir. 1984) (broadly worded title, general description of drawing, and objects of invention of parent patent application did not adequately support reissue application claims directed to genus of indicating mechanisms for dictating machines), *cert. denied,* 469 U.S. 1209 (1985); *In re Kaslow,* 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983) (claims to method of redeeming merchandise coupons, comprising step of providing an audit of coupon traffic, were not supported by specification of parent application).

Footnote 7. Higher pressure drops are associated with smaller cross-sectional areas for fluid flow. Mahurkar's opening brief to this court states that by applying well-known principles of fluid mechanics (i.e., the work of Poiseuille and Hagen), it can be calculated that the diameter of the circular (return) lumen would have to be in the range of 0.66 times the diameter of the two lumens combined in order to achieve proper blood flow at equal pressure drop. The 0.66 ratio falls within

the noted claim limitation.

Footnote 8. The following colloquy at oral argument before the district court supports our view:
Counsel for Mahurkar : "So the only evidence that we have on this subject from people of ordinary skill in the art is that the drawings do communicate these range limitations, and given the procedural posture of this case, the Court has to accept that evidence...."
District Court: * * * "And if you could have written a large number of things that were different from what was actually filed in 1984, then the diagram isn't enough.
And that seems to me something that can't be resolved by ogling the Ash declaration. It's really a pure question of law."

- End of Case -

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W.L. Gore & Associates, Inc. v. Garlock, Inc., 220 USPQ 303 (CA FC 1983)

W.L. Gore & Associates, Inc. v. Garlock, Inc.

(CA FC)
220 USPQ 303

Decided Nov. 14, 1983
Nos. 83-613/614
U.S. Court of Appeals Federal Circuit

Headnotes

PATENTS

1. Court of Appeals for the Federal Circuit -- Weight given decision reviewed (§ 26.59)

Parties' argument relating to salutory injunction of FRCivP 52(a) cannot be controlling on all issues, where dispositive legal error occurred in interpretation and application of patent statute, 35 USC.

2. Court of Appeals for the Federal Circuit -- Weight given decision reviewed (§ 26.59)

Findings that rest on erroneous view of law may be set aside on that basis.

3. Construction of specification and claims -- Claim defines invention

Claims measure and define invention.

4. Construction of specification and claims -- Combination claims (§ 22.35)

Infringement -- Process patents (§ 39.65)

Court's restriction of claimed multi-step process to one step constitutes error, whether done at behest of patentee relying on that restriction to establish infringement by one who employs only that one step in process otherwise distinct, or at behest of accused infringer relying on that restriction to establish invalidity by showing that one step in prior art process otherwise distinct; invention must be considered as whole.

5. Court of Appeals for the Federal Circuit -- Weight given decision reviewed (§ 26.59)

CAFC is not at liberty to substitute its own for district court's findings underlying district court's conclusion that claim is invalid.

6. Patentability -- Anticipation -- Process (§ 51.225)

It is irrelevant that those using invention may not have appreciated results where patent owner's operation of device is consistent, reproducible use of claimed invention; were that alone enough to prevent anticipation, it would be possible to obtain patent for old and unchanged process.

7. Use and sale -- Extent and character of use (§ 69.5)

Nonsecret use of claimed process in usual course of producing articles for commercial purposes is public use.

8. Use and sale -- Extent and character of use (§ 69.5)

Patentees' commercialization of product produced by its patented process can result in forfeiture of patent granted them for that process on application filed by them more than one year later; however, third party secret commercialization of process cannot be bar to patent grant on that process.

9. Patent grant -- Intent of patent laws (§ 50.15)

Early public disclosure is linchpin of patent system.

10. Interference -- Priority (§ 41.70)

Law disfavors prior inventor who benefits from process by selling its product but suppresses, conceals, or otherwise keeps process from public, as against later inventor who promptly files patent application from which public will gain disclosure of process.

11. Patentability -- Evidence of -- In general (§ 51.451)

District court that in its consideration of prior art disregarded unpredictability and unique nature of product to which claimed inventions relate errs.

12. Construction of specification and claims -- By prior art (§ 22.20)

District court that in its consideration of prior art considers claims in less than their entireties errs.

13. Patentability -- Evidence of -- Suggestions of prior art (§ 51.469)

District court that considers references in less than their entireties, i.e., in disregarding disclosures in references that diverge from and teach away from invention at hand, errs.

14. Construction of specification and claims -- Comparison with other claims (§ 22.40)

Claims must be considered individually and separately.

15. Patentability -- Anticipation -- Combining references (§ 51.205)

There must have been something present in teachings in references to suggest to one skilled in art that claimed invention before court would have been obvious.

16. Patentability -- Evidence of -- Suggestions of prior art (§ 51.469)

Fact that patentee proceeded contrary to accepted wisdom of prior art is strong evidence of nonobviousness.

17. Patentability -- Tests of -- Skill of art (§ 51.707)

Imbuing one of ordinary skill in art with knowledge of invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to insidious effect of hindsight syndrome wherein that which only inventor taught is used against its teacher.

18. Patentability -- Invention -- In general (§ 51.501)

Patentability -- Tests of -- Skill of art (§ 51.707)

Decisionmaker must forget what he or she has been taught at trial about claimed invention and cast mind back to time invention was made to occupy mind of one skilled in art who is presented only with references, and who is normally guided by then-accepted wisdom in art.

19. Pleading and practice in courts -- Burden of proof -- Validity (§ 53.138)

Presumption for patent grant -- Patent Office consideration of prior art (§ 55.5)

It is not law that presumption of validity is weakened greatly where Patent Office has failed to consider pertinent prior art; presumption has no separate evidentiary value; it cautions decisionmaker against rush to conclude invalidity; submission of additional art that is merely "pertinent" does not dispel that caution; however, inescapable burden of persuasion on one who would prove invalidity remains throughout trial.

20. Pleading and practice in courts -- Burden of proof -- Validity (§ 53.138)

Presumption from patent grant -- Patent Office consideration of prior art (§ 55.5)

Burden of proving invalidity may be facilitated by prior art that is more pertinent than that considered by PTO.

21. Patentability -- Evidence of -- In general (§ 51.451)

District court that specifically declines to consider objective evidence of nonobviousness errs; that evidence can often serve as insurance against insidious attraction of siren hindsight when confronted with difficult task of evaluating prior art; even when prior art evidence points more in direction of nonobviousness than obviousness, objective evidence may tend to reassure decisionmaker.

22. Patentability -- Anticipation -- In general (§ 51.201)

Anticipation requires disclosure in single prior art reference of each element of claim under consideration.

23. Patentability -- Anticipation -- Process (§ 51.225)

Patentability -- Composition of matter (§ 51.30)

Anticipation of inventions set forth in product claims cannot be predicated on mere conjecture respecting characteristics of products that might result from practice of processes disclosed in references.

24. Patentability -- Anticipation -- Infringement as test (§ 51.211)

Accused infringer's employment of process of dominating patent is not anticipation of invention described and claimed in improvement patent.

25. Patentability -- Anticipation -- In general (§ 51.201)

Patentability -- Invention -- In general (§ 51.501)

Inherency and obviousness are distinct concepts.

26. Patentability -- Evidence of -- In general (§ 51.451)

All evidence bearing on obviousness issue, as with any other issue raised in conduct of judicial process, must be considered and evaluated before required legal conclusion is reached.

27. Patentability -- Evidence of -- In general (§ 51.451)

Objective evidence of nonobviousness, i.e., "indicia" of Graham v. John Deere Co., 148 USPQ 459, may in given case be entitled to more weight or less, depending on its nature and its relationship to invention's merits; it may be most pertinent, probative, and revealing evidence available to aid in reaching conclusion on obvious/nonobvious issue.

28. Patentability -- Evidence of -- Commercial success -- In general (§ 51.4551)

Praise greeting products claimed in patent from suppliers, including owner of prior art patent, is objective evidence of nonobviousness.

29. Patentability -- Composition of matter (§ 51.30)

Claim to new product is not required to include critical limitations.

30. Specification -- Sufficiency of disclosure (§ 62.7)

Patents are written to enable those skilled in art to practice invention, not public, and Section 112 speaks as of application filing date, not as of time of trial.

31. Specification -- Sufficiency of disclosure (§ 62.7)

Section 112 requires that inventor set forth best mode of practicing invention known to him at time application was filed.

32. Claims -- Indefinite -- In general (§ 20.551)

Use of "stretching at rate exceeding specific percent per second" in claims is not indefinite.

33. Claims -- Specification must support (§ 20.85)

It is claimed invention for which enablement is required.

34. Specification -- Sufficiency of disclosure (§ 62.7)

Patent is not invalid merely because some experimentation is needed; patent is invalid only when those skilled in art are required to engage in undue experimentation to practice invention.

35. Construction of specification and claims -- Claim defines invention

Distinguishing what infringes from what does not is role of claims, not of specification.

36. Construction of specification and claims -- Defining terms (§ 22.45)

Patent applicant can be his own lexicographer.

37. Defenses -- Fraud (§ 30.05)

Fraud must be shown by clear and convincing evidence; state of mind of one making representations is most important of elements to be considered in determining existence of fraud; good faith and subjective intent, while they are to be considered, should not necessarily be made controlling; under ordinary circumstances, fact of misrepresentation coupled with proof that party making it had knowledge of its falsity is enough to warrant drawing inference that there was fraudulent intent; where public policy demands complete and accurate disclosure it may suffice to show nothing more than that misrepresentations were made in atmosphere of gross negligence as to their truth.

38. Pleading and practice in courts -- Issues determined -- Validity and infringement (§ 53.505)

Better practice is for district court to decide both validity and infringement issues when both are contested at trial, enabling conduct of single appeal and disposition of entire case in single appellate opinion.

39. Infringement -- Tests of -- Comparison with claim (§ 39.803)

Infringement is decided with respect to each asserted claim as separate entity.

Particular patents -- Porous Products

3,953,566, Gore, Process for Producing Porous Products, holding of invalidity of claims 3 and 19 reversed and of claims 1 and 17 affirmed.

4,187,390, Gore, Porous Products and Process Therefor, holding of invalidity reversed.

Case History and Disposition:

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Appeal from District Court for the Northern District of Ohio, Manos, J.; 220 USPQ 220 .

Consolidated actions by W. L. Gore & Associates, Inc., against Garlock, Inc., for patent infringement, in which defendant counterclaims for declaratory judgment of patent invalidity, noninfringement, fraudulent solicitation, and entitlement to attorney fees. From judgment for defendant, plaintiff appeals and defendant cross-appeals. Affirmed in part, reversed in part, and remanded; Davis, Circuit Judge, concurring in result in part and dissenting in part, with opinion.

Attorneys:
David H. Pfeffer, New York, N.Y. (J. Robert Dailey and Janet Dore, both of New York, N.Y., and John S. Campbell, Newark, Del., of counsel) for appellant.

John J. Mackiewicz, Philadelphia, Pa. (Dale M. Heist, Philadelphia, Pa., on the brief, Bernard Ouziel, New York, N.Y., of counsel) for appellee.

Judge:
Before Markey, Chief Judge, and Davis and Miller, Circuit Judges.

Opinion Text

Opinion By:
Markey, Chief Judge.

Appeal from a judgment of the District Court for the Northern District of Ohio holding U.S. Patents 3,953,566 ('566) and 4,187,390 ('390) invalid. We affirm in part, reverse in part, and remand for a determination of the infringement issue.

Background

Tape of unsintered polytetrafluorethylene (PTFE) (known by the trademark TEFLON of E.I. du Pont de Nemours, Inc.) had been stretched in small increments. W. L. Gore & Associates, Inc. (Gore), assignee of the patents in suit, experienced a tape breakage problem in the operation of its "401" tape stretching machine. Dr. Robert Gore, Vice President of Gore, developed the invention disclosed and

claimed in the '566 and '390 patents in the course of his effort to solve that problem. The 401 machine was disclosed and claimed in Gore's U.S. Patent 3,664,915 ('915) and was the invention of Wilbert L. Gore, Dr. Gore's father. PTFE tape had been sold as thread seal tape, i.e., tape used to keep pipe joints from leaking. The '915 patent, the application for which was filed on October 3, 1969, makes no reference to stretch rate, at 10% per second or otherwise, or to matrix tensile strength in excess of 7,300 psi.

Dr. Gore experimented with heating and stretching of highly crystalline PTFE rods. Despite slow, careful stretching, the rods broke when stretched a relatively small amount. Conventional wisdom in the art taught that breakage could be avoided only by slowing the stretch rate or by decreasing the crystallinity. In late October 1969, Dr. Gore discovered, contrary to that teaching, that stretching the rods as fast as possible enabled him to stretch them to more than ten times their original length with no breakage. Further, though the rod was thus greatly lengthened, its diameter remained virtually unchanged throughout its length. The rapid stretching also transformed the hard, shiny rods into rods of a soft, flexible material.

Gore developed several PTFE products by rapidly stretching highly crystalline PTFE, including: (1) porous film for filters and laminates; (2) fabric laminates of PTFE film bonded to fabric to produce a remarkable material having the contradictory properties of impermeability to liquid water and permeability to water vapor, the material being used to make "breathable" rainwear and filters; (3) porous yarn for weaving and braiding into other products, like space suits and pump packing; (4) tubes used as replacements for human arteries and veins; and (5) insulation for high performance electric cables.

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On May 21, 1970, Gore filed the patent application that resulted in the patents in suit. The '566 patent has 24 claims directed to processes for stretching highly crystalline, unsintered, PTFE. The processes, inter alia, include the steps of stretching PTFE at a rate above 10% per second and at a temperature between about 35°C and the crystalline melt point of PTFE. The '390 patent has 77 claims directed to various products obtained by processes of the '566 patent.

It is effectively undisputed that the present inventions filled a long sought yet unfilled need. The United States Army and the research director of a Garlock Inc. (Garlock) customer had been looking for and following up every remote lead to a waterproof/breathable material for many years.

It is undisputed that the present inventions enjoyed prompt and remarkable commercial success due to their merits and not to advertising or other extraneous causes.

It is undisputed that the inventions provide the most important synthetic material available for use in vascular surgery, hundreds of thousands of persons having received artificial arteries formed of the patented products since 1976, and that the patented products have unique properties useful in other medical procedures, in communications satellites, radar systems, and electrical applications.

It is undisputed that the major sources of PTFE, ICI and du Pont, greeted the patented products as "magical," 'bewitching," "a remarkable new material," and one that "differs from other processed forms of Teflon."

It is undisputed that the patented products were met with skepticism and disbelief by at least one scientist who had worked with PTFE at du Pont for many years and who testified as an expert at trial.

It is undisputed that Garlock first produced an accused product in response to a customer's request for a substitute for the patented product, that Garlock advertised its accused product as a "new form" of PTFE and as "a versatile new material which provides new orders of performance for consumer,

industrial, medical and electrical applications," and that the customer describes that accused product as "a new dimension in rainproof/breathable fabrics."

Proceedings

On Nov. 2, 1979, Gore sued Garlock for infringement of process claims 3 and 19 of the '566 patent, and sought injunctive relief, damages and attorney fees. Garlock counterclaimed on Dec. 18, 1979, for a declaratory judgment of patent invalidity, non-infringement, fraudulent solicitation, and entitlement to attorney fees. On Feb. 7, 1980, Gore filed a second suit for infringement of product claims 14, 18, 36, 43, 67 and 77 of the '390 patent. In light of a stipulation, the district court consolidated the two suits for trial.

Gore alleged infringement of certain claims by certain products:

Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

At trial, Garlock addressed only claims 1, 3, 17, and 19 of the '566 patent and claims 1, 9, 12, 14, 18, 35, 36, 43, 67 and 77 of the '390 patent. See Appendix to this opinion.

The district court, in a thorough memorandum accompanying its judgment, and in respect of the '566 patent: (1) found claim 1 anticipated under 35 U.S.C. §102(a) by Gore's use of its 401 machine and use by the Budd Company (Budd) of a Cropper machine; (2) declared all claims of the patent invalid under 102(b) because the invention had been in public use and on sale more than one year before Gore's patent application, as evidenced by Budd's use of the Cropper machine; (3) held claims 1, 3, 17 and 19 invalid for obviousness under 35 U.S.C. §103, on the basis of various reference pairings: (a) Japanese patent 13560/67 (Sumitomo) with U.S. patent 3,214,503 (Markwood); (b) U.S. patent 2,776,465 (Smith) with Markwood; or (c) Gore's '915 patent with Sumitomo; and (4) held all claims invalid as indefinite under 35 U.S.C. §112. [1]

In its opinion respecting the '390 patent, the district court held: (1) claims 1, 9, 12, 14, 18, 35, 36, 43, 67 and 77 invalid §§102 and 103 in view of Sumitomo and Smith; and (2) all claims invalid as indefinite under §112.

The court found that Gore did not commit fraud before the Patent and Trademark Office (PTO), denied Garlock's request for attorney fees, and refrained from deciding the infringement issue.

Issues

Did the district court err in: (1) its holding of invalidity under §§102(a), 102(b), 103 and 112; (2) its finding that Gore did not commit fraud on the PTO; or (3) denying attorney fees.

Opinion

This hard fought and bitterly contested case involved over two years of discovery, five weeks of trial, the testimony of 35 witnesses (19 live, 16 by deposition), and over 300 exhibits. The district court issued an exhaustive 37-page memorandum opinion reflective of a careful, conscientious approach to the determination of the many issues presented at trial.

The record on appeal consists of 2000 pages. The parties' briefs total 199 pages. In those briefs, counsel repeatedly accuse each other of numerous and serious breaches of the duty of candor owed the court. Each cites instances in which the testimony, the findings, and the record are or are said to be quoted in part and out of context. As a result, the usefulness and reliability of the briefs as means of informing the court has been greatly diminished if not destroyed, and careful, time-consuming

study of all exhibits and each page of the record has been required.

Appellant cited 80 prior court opinions in its main brief. Appellee's brief totally ignores all but two of those citations, but adds 57 more. Appellant's reply brief cites 126 prior court opinions, 34 earlier cited, 67 newly cited, and 25 of those cited by appellee. Appellee's reply brief cites 17 prior court opinions, 4 earlier cited, 7 newly cited, and 6 of the 147 cited by appellant. Accordingly, 211 prior court opinions have been evaluated in relation to the proof found in the record.

In light of the entire record and the applicable law, we are convinced that Garlock failed to carry its burden of proving all claims of the present patents invalid.

Standard of Review

[1]

[2] Where, as here, dispositive legal error occurred in interpretation and application of the patent statute, 35 U.S.C., the parties' arguments relating to the salutory injunction of Fed.RuleCiv.P. 52(a) cannot be controlling on all issues. Findings that "rest on an erroneous view of the law may be set aside on that basis," Pullman-Standard v. Swint, 456 U.S. 273 (1982). Thus it is unnecessary here to set aside any probative fact found by the district court on the basis of its being clearly erroneous, or to engage in what would be an inappropriate reweighing of the facts.

Among the legal errors extant in the record, each of which is discussed below, are (1) the invention set forth in each claim was not in each instance considered as a whole; (2) 35 U.S.C. §102(b) was applied though criteria for its application were not present; (3) the references were not assessed in their entireties; (4) an inherency theory under §§102 and 103 was inappropriately applied; (5) that which only the inventor taught was attributed to the prior art; (6) individual steps in prior art processes dealing with materials distinct from those with which the present inventions dealt were erroneously equated to steps in the claimed processes; (7) objective evidence of nonobviousness was disregarded; and (8) the function and application of §112 were misconstrued.

Because it permeated so much of the district court's analysis, we note more fully its frequent restriction of its consideration to 10% per second rate of stretching, which it called the "thrust of the invention." That approach is repeated throughout Garlock's briefs, which refer repeatedly to the "thrust of the invention," to "the inventive concept," and to the claims "shorn of their extraneous limitations." That facile focusing on the "thrust," "concept," and "shorn" claims, resulted in treating the claims at many points as though they read differently from those actually allowed and in suit.

[3] It is true that Dr. Gore emphasized rapid stretching, for example, as well as the amount of stretch and other process limitations, during prosecution of the application for the '566 patent. Yet it is the claims that measure and define the invention. Aro Manufacturing Co. v. Convertible Top Replacement Co., 365 U.S. 336, 339, 128 USPQ 354 (1961); Bowser, Inc. v. U.S., 388 F.2d 346, 349, 156 USPQ 406, 409 (Ct. Cl. 1967).

[4] Each claimed invention must be considered as a whole. 35 U.S.C. §103; Schenck, A.G. v. Nortron Corp., 218 USPQ 698, 700 (Fed. Cir. 1983). In determining obviousness, there is "no legally recognizable or protected 'essential,' 'gist,' or 'heart' of the invention." Aro, 365 U.S. at 345. A court's restriction of a claimed multi-step process to one step constitutes error, whether done at the behest of a patentee relying on that restriction to establish infringement by one who employs only that one step in a process otherwise distinct, or at the behest of an accused infringer relying on that restriction to establish invalidity by showing that one step in a prior art process otherwise distinct.

(1) Invalidity

(a) '566 Patent

(i) §102(a) and The 401 Machin

It is undisputed that the district court held only claim 1 of the '566 patent to have been anticipated under §102(a) by operation of the 401 machine in the Gore shop before Dr. Gore's invention in late October 1969. It did so on the deposition testimony of two former Gore employees, documents, and drawings of the 401 machine.

In August 1969, Gore offered to sell to Export Tool Company (Export) tape "to be made" on the 401 machine. Tape made on the 401 machine was shipped to Export on October 24, 1969. The trial judge found the rolls on the 401 machine were, at least at some point in time before October 1969, spaced less than four feet apart and that the rate of stretch accomplished in operating that machine (admittedly operated in accord with the description of machine operation in the '915 patent) must have been greater than 10% per second. The district court credited testimony that Teflon 6-c, a highly crystalline form of Teflon, was used because it was the standard resin at the time, and that the tape was stretched at a temperature above 35°C. Thus it cannot be said that the record fails to support the district court's finding that the limitations of claim 1 were met by Gore's operation of the 401 machine before Dr. Gore's asserted "late October 1969" date of invention. Though he was working with the operation of the 401 machine, Dr. Gore offered no proof that his invention date was before the date of shipment to Export.

[5] Gore, seeking a review here of the evidence, points to certain inadequacies as indicating a failure to meet the required clear and convincing standard under §102(a). At the time of trial, the district court, bound by precedent then applicable, applied a preponderance of the evidence test. Gord asserts, erroneously, that the clearly erroneous standard does not therefore apply on this appeal. Gore does not, however, point to any basis on which the district court's findings must be held to have been clearly erroneous under the clear and convincing standard. We are not at liberty, of course, to substitute our own for the district court's findings underlying its conclusion that claim 1 is invalid.

[6] Gore's operation of the 401 machine must thus be viewed as a consistent, reproducible use of Dr. Gore's invention as set forth in claim 1, and it is therefore irrelevant that those using the invention may not have appreciated the results. General Electric Co. v. Jewel Incandescent Lamp Co., 326 U.S. 242, 248, 67 USPQ 155, 157-58 (1945). Were that alone enough to prevent anticipation, it would be possible to obtain a patent for an old and unchanged process. Ansonia Brass & Copper Co. v. Electric Supply Co., 144 U.S. 11, 18 (1892); see, H.K. Regar & Sons, Inc. v. Scott & Williams, Inc., 63 F.2d 229, 231, 17 USPQ 81, 83 (2d Cir. 1933).

[7] The nonsecret use of a claimed process in the usual course of producing articles for commercial purposes is a public use. Electric Storage Battery Co. v. Shimadzu, 307 U.S. 5, 20, 41 USPQ 155, 161 (1939), and there was no evidence that any different process was used to produce the articles shipped to Export.

Thus it cannot be said that the district court erred in determining that the invention set forth in claim 1 of '566 patent was known or used by others under §102(a), as evidenced by Gore's operation of the 401 machine before Dr. Gore's asserted date of that invention.

In view of our affirmance of the judgment reached on claim 1 under 102(a), we need not discuss other asserted grounds of invalidity of claim 1. There was, however, no evidence whatever that the inventions set forth in other claims, of either the '566 or the '390 patent, were known or used by others as a result of Gore's operation of the 401 machine before late October 1969.

(ii) §102(b) and the Cropper Machine

In 1966 John W. Cropper (Cropper) of New Zealand developed and constructed a machine for producing stretched and unstretched PTFE thread seal tape. In 1967, Cropper sent a letter to a company in Massachusetts, offering to sell his machine, describing its operation, and enclosing a photo. Nothing came of that letter. There is no evidence and no finding that the present inventions thereby became known or used in this country.

In 1968, Cropper sold his machine to Budd, which at some point thereafter used it to produce and sell PTFE thread seal tape. The sales agreement between Cropper and Budd provided:

ARTICLE "E" - PROTECTION OF TRADE SECRETS Etc.

> *1. BUDD* agrees that while this agreement is in force it will not reproduce any copies of the said apparatus without the express written permission of Cropper nor will it divulge to any person or persons other than its own employees or employees of its affiliated corporations any of the said known-how or any details whatsoever relating to the apparatus.
>
> *2. BUDD* agrees to take all proper steps to ensure that its employees observe the terms of Article "E" 1 and further agrees that whenever it is proper to do so it will take legal action in a Court of competent jurisdiction to enforce any one or more of the legal or equitable remedies available to a trade secret plaintiff.

Budd told its employees the Cropper machine was confidential and required them to sign confidentiality agreements. Budd otherwise treated the Cropper machine like its other manufacturing equipment.

A former Budd employee said Budd made no effort to keep the secret. That Budd did not keep the machine hidden from employees legally bound to keep their knowledge confidential does not evidence a failure to maintain the secret. Similarly, that du Pont employees were shown the machine to see if they could help increase its speed does not itself establish a breach of the secrecy agreement. There is no evidence of when that viewing occurred. There is no evidence that a viewer of the machine could thereby learn anything of which process, among all possible processes, the machine is being used to practice. As Cropper testified, looking at the machine in operation does not reveal whether it is stretching, and if so, at what speed. Nor does looking disclose whether the crystallinity and temperature elements of the invention set forth in the claims are involved. There is no evidence that Budd's secret use of the Cropper machine made knowledge of the claimed process accessible to the public.

The district court held all claims of the '566 patent invalid under 102(b), supra, note 3, because "the invention" was "in public use [and] on sale" by Budd more than one year before Gore's application for patent. Beyond a failure to consider each of the claims independently, 35 U.S.C. §282; Altoona Publix Theatres, Inc. v. American Tri-Ergon Corp., 294 U.S. 477, 487, 24 USPQ 308 (1935), and a failure of proof that the claimed inventions as a whole were practiced by Budd before the critical May 21, 1969 date, it was error to hold that Budd's activity with the Cropper machine, as above indicated, was a "public" use of the processes claimed in the '566 patent, that activity having been secret, not public.

Assuming, arguendo, that Budd sold tape produced on the Cropper machine before October 1969, and that that tape was made by a process set forth in a claim of the '566 patent, the issue under §102 (b) is whether that sale would defeat Dr. Gore's right to a patent on the process inventions set forth in the claims.

[8] If Budd offered and sold anything, it was only tape, not whatever process was used in producing it. Neither party contends, and there was no evidence, that the public could learn the claimed process by examining the tape. If Budd and Cropper commercialized the tape, that could result in a

forfeiture of a patent granted them for their process on an application filed by them more than a year later. D.L. Auld Co. v. Chroma Graphics Corp., No. 83-585, slip op. at 5-6 (Fed. Cir. Aug. 15, 1983); See Metalizing Engineering Co. v. Kenyon Bearing & Auto Parts Co., 153 F.2d 516, 68 USPQ 54 (2d Cir. 1946). There is no reason or statutory basis, however, on which Budd's and Cropper's secret commercialization of a process, if established, could be held a bar to the grant of a patent to Gore on that process.

[9]

[10] Early public disclosure is a linchpin of the patent system. As between a prior inventor who benefits from a process by selling its product but suppresses, conceals, or otherwise keeps the process from the public, and a later inventor who promptly files a patent application from which the public will gain a disclosure of the process, the law favors the latter. See Horwath v. Lee, 564 F.2d 948, 195 USPQ 701 (CCPA 1977). The district court therefore erred as a matter of law in applying the statute and in its determination that Budd's secret use of the Cropper machine and sale of tape rendered all process

claims of the '566 patent invalid under §102(b).

(iii) §103

In considering claims 1, 3, 17, and 19 of the '566 patent, the district court recognized that analysis of the obviousness issue under §103 requires determination of the scope and content of the prior art, the differences between the prior art, and the claims at issue, and the level of ordinary skill in the pertinent art. Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

[11]

[12]

[13] In its consideration of the prior art, however, the district court erred in not taking into account the import of the markedly different behavior of PTFE from that of conventional thermoplastic polymers clearly established and undisputed on the record, and in thus disregarding the unpredictability and unique nature of the unsintered PTFE to which the claimed inventions relate, In re Whiton, 420 F.2d 1082, 164 USPQ 455 (CCPA 1970); in considering claims in less than their entireties, Schenck, supra; and in considering the references in less than their entireties, i.e., in disregarding disclosures in the references that diverge from and teach away from the invention at hand. In re Kuderna, 426 F.2d 385, 165 USPQ 575 (CCPA 1970).

Invalidity of claim 1 under §102(a) having been determined, it is unnecessary to discuss in detail the applicability of §103 to that claim. If claim 1 had not been held anticipated under §102(a) in light of operation of the 401 machine, it is clear from the discussion here that claim 1 could not properly have been held invalid under §103.

Claim 3 depends from and thus incorporates claim 1 but specifies a rate of stretch of 100% per second. Claim 17 also depends from claim 1 and specifies an amount of stretch of about twice the original length. Claim 19 depends from claim 17 but specifies an amount of stretch of about five times the original length.

U.S. patent 2,983,961 to Titterton, Volume 13 of the Encyclopedia of Polymer Science and Technology (1970), the Sumitomo patent, and witnesses for both parties, establish that teachings related to conventional thermoplastic polymers are inapplicable to PTFE.

Articles by Dogliotti and Yelland, Effect of Strain Rate on the Viscoelastic Properties of High Polymeric Fibrous Materials, 4 High Speed Testing 211 (1964) and Robinson and Graham, Methods

of Characterization of Polymeric Materials by High Speed Testing Techniques, 5 High Speed Testing 261 (1965), teach that conventional plastics and sintered PTFE can be stretched further if stretched slowly. Dr. Gore demonstrated at trial and at oral argument before us that an attempt to stretch highly crystalline, unsintered PTFE slowly results in breakage, and that rapid stretching produces a greatly lengthened rod of soft, flexible material.

The '566 patent contains an example of stretching an article to 16 times its length. Smith and the '915 patent teach that PTFE could not be stretched beyond four times its length without heating it to above its crystalline melt temperature, a step avoided by Dr. Gore and as set forth in the claims.

Sumitomo teaches that there is a length limit to stretching unsintered PTFE, and does not suggest what that limit might be. Markwood, U.S. patent 3,208,100 to Nash (Nash), and U.S. patent 2,823,421 to Scarlett (Scarlett) teach that *non-PTFE* thermoplastics can be stretched rapidly and to extended lengths, and *also* teach reduction, elimination, or avoidance of crystallinity before stretching.

The disclosure in the Smith and '915 patents that a PTFE article may be stretched to as much as four times its length encompasses the step of stretching to twice its length set forth in claim 17 and establishes that such step would have been obvious.

[14] Claims 3 and 19 must be considered individually and separately. 35 U.S.C. §282. Nowhere, in any of the references, is it taught or suggested that highly crystalline, unsintered PTFE could be stretched at a rate of about 100% per second as required by asserted claim 3. Nor is it anywhere suggested that by rapid stretching a PTFE article be stretched to more than five times its original length as required by asserted claim 19. On the contrary, the art as a whole teaches the other way.

[15] In concluding that obviousness was established by the teachings in various pairs of references, the district court lost sight of the principle that there must have been something present in those teachings to suggest to one skilled in the art that the claimed invention before the court would have been obvious. In re Bergel, 292 F.2d 955, 956-57, 130 USPQ 206, 208 (CCPA 1961); In re Sponnoble, 405 F.2d 578, 585, 160 USPQ 237, 244 (CCPA 1969).

The court's pairing of Sumitomo and Markwood disregarded, as above indicated, the undisputed evidence that the unsintered PTFE of Sumitomo does not respond to the conventional plastics processing of Markwood and the art recognition of that fact. Whiton, supra, 420 F.2d at 1085, 164 USPQ at 457.

In evaluating claim 19, for example, the pairing disregarded Sumitomo's limited

length of stretch teaching. In evaluating claim 3, the court recognized that Sumitomo made no mention of rate of stretch. Looking to Markwood to supply that teaching disregarded not only the conventional plastics-unsintered PTFE distinction but also the clear divergence of Markwood's teaching that crystallinity must be reduced or avoided from the presence of "highly crystalline" in all claims of the '566 patent.

Similarly, and for many of the same reasons, the pairing of Markwood's and Smith's teachings was an inappropriate basis for concluding that the processes set forth in claims 3 and 19 would have been obvious. As above indicated, Markwood's rapid stretching of conventional plastic polypropylene with reduced crystallinity would not suggest rapid stretching of highly crystalline PTFE, in light of teachings in the art that PTFE should be stretched slowly. The Smith patent is owned by du Pont, where Dr. Gore's process invention was considered to have produced a "remarkable new material." That circumstance is not surprising, for Smith, though dealing with PTFE, says not a word about any rate of stretch.

Lastly, the pairing of Sumitomo and the '915 patent suffers from the same shortcomings. The pairing resulted from a hypothetical set forth in Garlock's post trial brief, and was based on no testimony or other evidence in the record. In respect to claim 3, neither reference mentions rate of stretch or suggests its importance. In respect of claim 19 both references point away from the claimed invention in their limited length-of-stretch teachings. The '915 patent states: "the 65 percent expanded material could be expanded a second time for an additional 65 percent expansion or a total length increase ratio of 1:2.72 [less than three times the original length). However, great care was necessary to obtain a uniformly expanded material at these very great expansion ratios." Thus the '915 patent suggests that the amount of stretch of 500% set forth in claim 19 (more than five times the original length) is not possible.

As indicated, Sumitomo and Smith are totally silent respecting the rate of stretch, and there is simply no teaching in the art that would suggest to one of ordinary skill that Markwood's fast stretching of other thermoplastics could or should be employed in the process of treating PTFE taught by either Sumitomo or Smith. Indeed, Smith not only says nothing about rate of stretch, its preferred teaching is away from other elements of the inventions set forth in claims 3 and 19 Smith discloses that stretching should be done after the PTFE is heated above its crystalline melting point and with decreased crystallinity. Smith teaches:

> Below about 300°C it is *not possible* to draw more than about 4X [times] and while such draw ratios can be attained around 300°C and below the polymer's crystalline melting point with resultant orientation and improved properties it is preferred to use temperatures at or above the polymer's crystalline melting point. (Emphasis added).

Nash teaches that the film should be plasticized, i.e., made more viscous, before stretching. Contrary to that teaching, Dr. Gore did not reduce crystallinity before increasing the rate of stretch, but maintained the unsintered PTFE "highly crystalline" while stretching at a 100% per second rate and to more than five times, as set forth respectively in claims 3 and 19.

[16] On the entire record and in view of all the references, each in its entirety, it is clear that a person of ordinary skill confronted with a PTFE tape breakage problem would have either slowed the rate of stretching or increased the temperature to decrease the crystallinity. Dr. Gore did neither. He proceeded contrary to the accepted wisdom of the prior art by dramatically increasing the rate and length of stretch *and* retaining crystallinity. That fact is strong evidence of nonobviousness. United States v. Adams, 383 U.S. 39 (1966).

Having learned the details of Dr. Gore's invention, the district court found it within the skill of the art to stretch other material rapidly (Markwood); to stretch PTFE to increase porosity (Sumitomo); and to stretch at high temperatures (Smith). The result is that the claims were used as a frame, and individual, naked parts of separate prior art references were employed as a mosaic to recreate a facsimile of the claimed invention. At no point did the district court, nor does Garlock, explain why that mosaic would have been obvious to one skilled in the art in 1969, or what there was in the prior art that would have caused those skilled in the art to disregard the teachings there found against making just such a mosaic. On the contrary, the references and the uncontested testimony, as above indicated, established that PTFE is sui generis. It is not surprising, therefore, that, unlike the situation in Stratoflex, Inc. v. Aeroquip Corp., 218 USPQ 871 (Fed. Cir. 1983), there was no testimony and no finding that one skilled in the art would transfer conventional thermoplastic processes to those for unsintered PTFE, or would have been able to predict what would happen if they did.

[17] To imbue one of ordinary skill in the art with knowledge of the invention in suit,

when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is

used against its teacher.

[18] It is difficult but necessary that the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art. Had that been here done the inventions set forth in the claims 3 and 19 of the '566 patent could only have been held non-obvious to those skilled in the art at the time those claimed inventions were made.

[19] Error in visualizing the burden of proof on obviousness may have contributed to the court's application here of the prior art. Adopting the phrase from earlier precedents, the court said "the presumption [of validity] is weakened greatly where the Patent Office has failed to consider pertinent prior art." That is not the law of established precedent in this court. SSIH Equipment S.A. v. ITC, 218 USPQ 678, 687 (Fed. Cir. 1983); Solder Removal Co. v. ITC, 582 F.2d 628, 633, 199 USPQ 129, 133, n. 9 (CCPA 1978). The presumption has no separate evidentiary value. It cautions the decisionmaker against a rush to conclude invalidity. Submission of additional art that is merely "pertinent" does not dispel that caution. It is difficult to imagine a patent law suit in which an accused infringer is unable to add some new "pertinent" art. The inescapable burden of persuasion on one who would prove invalidity, however, remains throughout the trial. 35 U.S.C. §282.

[20] The burden of proving invalidity may of course be facilitated by prior art that is *more pertinent* than that considered by the PTO. That did not happen here. In the present case, Sumitomo, Smith, and the '915 patent were among references considered by the PTO. Other references referred to as not considered were merely cumulative, disclosing nothing not disclosed in references that were considered by the PTO. The Canadian counterpart of Nash was considered by the PTO. The relevant disclosures of Markwood appear in Sandiford patent 3,544,671 and Paratheon patent 3,637,906, both considered by the PTO. The Russian Author's Certificate 240,997, assuming its status as prior art and whatever the material with which it dealt, contributed nothing beyond the teachings of the '915 patent considered by the PTO.

[21] As discussed more fully below, the district court erred in specifically declining to consider the objective evidence of nonobviousness. In re Sernaker, 702 F.2d 989, 996, 217 USPQ 1, 7 (Fed. Cir. 1983). That evidence can often serve as insurance against the insidious attraction of the siren hindsight when confronted with a difficult task of evaluating the prior art. Though the prior art evidence here pointed more in the direction of nonobviousness than obviousness, the objective evidence may tend, as it did in Sernaker, supra, to reassure the decisionmaker.

In sum, the district court erred as a matter of law on this record in concluding that Garlock had met its burden of proving that the inventions of claims 3 and 19 of the '566 patent would have been obvious.

(b) ' *390 patent*

(i) *§102*

The district court found product claims 1, 9, 12, 14, 18 and 43 inherently anticipated because it found that the microstructure of nodes interconnected by fibrils is an inherent characteristic of paste-extruded PTFE products resulting from the process disclosed in Smith. The court found the first four of those claims and claim 43, plus claims 35, 36, 67 and 77 inherently anticipated because high strength PTFE products are inherent in the examples of Sumitomo.

The teachings of Smith include neither a disclosure nor a suggestion of "porous" products having a "microstructure characterized by nodes interconnected by fibrils" as required by the claims found to have been anticipated by Smith.

The teachings of Sumitomo do not include a disclosure of products having "a matrix tensile strength

* * * above about 7,300 psi" as required by the claims found to have been anticipated by Sumitomo.

[22] Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. Soundscriber Corp. v. U.S., 360 F.2d 954, 960, 148 USPQ 298, 301, adopted, 149 USPQ 640 (Ct. Cl. 1966). Neither Smith nor Sumitomo disclose an invention set forth in any claim of the '390 patent.

The incongruity in findings that the different processes of Smith and Sumitomo each inherently produced identical products is striking.

Garlock attempted with expert testimony to overcome the prior art shortcomings as proof of anticipation. Gore rebutted with its own expert testimony. It is unnecessary, however, to resolve apparent conflicts in the divergent testimony, much if not all of which took

the form of pure unsupported assertion. No inter partes tests in which the Smith and Sumitomo processes were conducted are of record. No products of those processes were placed in evidence, and there was, of course, no analysis of any such evidentiary products.

Nor is it necessary to evaluate the inappropriate disparagement in Garlock's brief of Dr. Sperati as a "friend" of Gore.

[23] Given the unique nature of unsintered PTFE, we are not persuaded that the "effect" of the processes disclosed in Smith and Sumitomo, an "effect" undisclosed in those patents, would be always to inherently produce or be seen always to produce products meeting all of the claim limitations. Anticipation of inventions set forth in product claims cannot be predicated on mere conjecture respecting the characteristics of products that might result from the practice of processes disclosed in references. In re Felton, 484 F.2d 495, 500, 179 USPQ 295, 298 (CCPA 1973). It is clear that the teachings of neither Smith nor Sumitomo place the products claimed in the '390 patent in possession of the public.

The teachings of Smith and Sumitomo are so unacceptably vague concerning characteristics of products produced by their respective processes as not to support an anticipation rejection. That fact is confirmed by the PTO's having fully considered those references and by its having issued the '390 patent over them.

[24] Garlock's assertion that it employs a process covered by the Smith patent, if true, is irrelevant. The '390 patent was allowed over Smith as a reference. Assuming Smith is a dominating patent, the rule of law is clear that an accused infringer's employment of the process of a dominating patent does not render that employment an anticipation of an invention described and claimed in an improvement patent. As indicated, there is no present record basis for finding that the Smith process in itself necessarily and inherently results in the products, each considered in its entirety, in the claims of the '390 patent. The testimony of Garlock's expert about ex parte tests, the records of which he destroyed before trial, cannot serve as such a basis. The effusive praise of Dr. Gore's claimed products by the owner of the Smith patented process would appear, on the contrary, to confirm the action of the PTO in issuing the '390 patent.

Garlock has not met its burden of showing that claims 1, 9, 12, 14, 18, and 43 are anticipated by Smith or that claims 1, 9, 12, 14, 35, 36, 43, 67, and 77 are anticipated by Sumitomo.

(ii) *§103*

[25] The scope and content of the prior art and level of ordinary skill, discussed above in relation to the '566 patent, would be the same for the '390 patent. The district court did not, however, nor does Garlock, apply the Graham criteria, supra, to the '390 claims, apparently assuming that the claimed products, having been found inherent in the processes of Sumitomo and Smith, would have been

obvious in view of those references. If so, that was error. Inherency and obviousness are distinct concepts. In re Spormann, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966).

In discussing inherency the district court did recognize differences between Smith's disclosure and the inventions set forth in claims 1, 9, 12, 14, 18, and 43, i.e., the absence from Smith of a description of the products of Smith's process as porous and the absence from Smith of a disclosure that those products have a microstructure characterized by nodes interconnected by fibrils.

Similarly, a difference between Sumitomo's disclosure and the inventions set forth in claims 1, 9, 12, 14, 35, 36, 43, 67, and 77 was recognized in the absence from Sumitomo of a quantification of the matrix tensile strengths of the products of Sumitomo's process. The district court also discussed differences between the dependent claims and the prior art. Because we conclude that the independent claims of the '390 patent are patentable over the art of record, we need not discuss the dependent claims.

[26] Having determined that the invention would have been obvious in view of the process of either Smith or Sumitomo, the district court did not discuss the strong showing of objective evidence of nonobviousness here present, saying with respect to one part of such evidence, "no amount of commercial success can save it." That approach was error. All evidence bearing on the issue of obviousness, as with any other issue raised in the conduct of the judicial process, must be considered and evaluated *before* the required legal conclusion is reached. Stratoflex, supra, 218 USPQ at 879.

[27] The objective evidence of nonobviousness, i.e., the "indicia" of Graham, supra, may in a given case be entitled to more weight or less, depending on its nature and its relationship to the merits of the invention. It may be the most pertinent, probative, and revealing evidence available to aid in reaching a conclusion on the obvious/nonobvious issue. It should when present always be considered as an integral part of the analysis.

Gore's fabric laminates, for example, as set forth in claims 36 and 77, satisfied a long-felt

need for a material having the contradictory properties of being simultaneously breathable (allowing water vapor or perspiration to pass) and waterproof. The record establishes that such a material had long been sought by makers of rainwear and outerwear, and by the U.S. Army as well. That Gore's fabric laminates filled that need is attested by the rise in their annual dollar sales from zero to seven million in the first five years of their availability.

Gore's PTFE tubes for replacement of human arteries and veins, also satisfied a long-felt need. The uncontradicted evidence establishes that Gore's PTFE tubes hold blood without leaking, need not be pre-clotted with the patient's blood, are chemically inert, and, being breathable, are less likely to cause an air embolism. The value and uniqueness of those four properties make Gore's PTFE tubes, as described in unchallenged testimony, "the most important synthetic material presently existing" in vascular surgery, and, along with other evidence in the record, reflect the intended working of the patent system.

As discussed above, current annual sales of over sixty million dollars are attributable to the merits of the products claimed in the '390 patent. Considering the long-felt need for those products and the obvious commercial advantage to be gained by meeting that need, it is reasonable to conclude that the claimed products of the '390 patent would not have been obvious to persons of ordinary skill in the art at the time the claimed inventions were made.

[28] As above indicated, the praise which greeted the products claimed in the '390 patent from PTFE suppliers, including the owner of the Smith patent, is further objective evidence of nonobviousness.

[29] Garlock's appeal argument that the '390 claims are invalid because the recited minimum matrix

tensile strengths are not "critical" is without merit. A claim to a new product is not legally required to include critical limitations. In re Miller, 441 F.2d 689, 696, 169 USPQ 597, 602 (CCPA 1971). The '390 claims are not drawn to optimization of ingredients or ranges within broad prior art teachings, but to new porous PTFE products of particular characteristics.

In sum, and in view of the difficulty of working with unsintered PTFE and its unpredictable response to various processing techniques, the vagueness of Smith and Sumitomo concerning the products produced by those processes, the filling of at least two long-felt needs and the commercial success described above, we conclude that the inventions set forth in claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of the '390 patent would not have been obvious to those skilled in the art at the time those inventions were made.

(c) §112 and the '566 and '390 patents

The patents in suit resulted from a single application and thus have substantially identical specifications. The holding of invalidity on the basis of §112 is common to both patents.

The district court found that the patents did not disclose sufficient information to enable a person of ordinary skill in the art to make and use the invention, as required by §112, first paragraph, and that certain claim language was indefinite, presumably in light of §112, second paragraph, because: (1) there was no definition in the specification of "stretch rate," different formulae for computing stretch rate having been developed and presented at trial; (2) there was no way taught in the specification to calculate the minimum rate of stretch above 35°C; (3) the phrase "matrix tensile strength" is indefinite; and (4) the phrase "specific gravity of the solid polymer" is indefinite.

[30] The findings rest on a misinterpretation of §112, its function and purpose. The district court considered whether certain terms would have been enabling to the public and looked to formula developments and publications occurring well after Dr. Gore's filing date in reaching its conclusions under §112. Patents, however, are written to enable those skilled in the art to practice the invention, not the public. In re Storrs, 245 F.2d 474, 478, 114 USPQ 293, 296-97 (CCPA 1957), and §112 speaks as of the application filing date, not as of the time of trial. In re Mott, 539 F.2d 1291, 1296, 190 USPQ 536, 541 (CCPA 1976). There was no evidence and no finding that those skilled in the art would have found the specification non-enabling or the claim language indefinite on May 21, 1970, when the application which resulted in issuance of Dr. Gore's patents was filed. Indeed, the expert quoted by the district court and whose testimony was primarily relied upon respecting formulae, was still in school at that time.

There is uncontradicted evidence in the record that at the time the application was filed "stretch rate" meant to those skilled in the art the percent of stretch divided by the time of stretching, and that the latter was measurable, for example, with a stopwatch. Concern for the absence from the specification of a formula for calculating stretch rate is therefore misplaced, and the post-filing date development of varying formulae, including Dr. Gore's later addition of a formula in his corresponding Japanese patent, is irrelevant.

[31] Section 112 requires that the inventor set forth the best mode of practicing the invention known to him at the time the application was filed. Calculating stretch rate at that time was accomplished by actually measuring the time required to stretch the PTFE material. That was the only mode then used by the inventor, and it worked. The record establishes that calculation by that mode would have been employed by those of ordinary skill in the art at the time the application was filed. As indicated, Dr. Gore's disclosure must be examined for §112 compliance in light of knowledge extant in the art on his application filing date.

[32] The district court, though discussing enablement, spoke also of indefiniteness of "stretch rate," a

matter having to do with §112, second paragraph, and relevant in assessment of infringement. The use of "stretching * * * at a rate exceeding about 10% per second" in the claims is not indefinite. Infringement is clearly assessable through use of a stopwatch. No witness said that could not be done. As above indicated, subsequently developed and therefore irrelevant formulae cannot be used to render non-enabling or indefinite that which was enabling and definite at the time the application was filed.

[33] Similarly, absence from the specification of a method for calculating the minimum rate of stretch above 35°C does not render the specification non-enabling. The specification discloses that "[t]he lower limit of expansion rates interact with temperature in a roughly logarithmic fashion, being much higher at higher temperatures." Calculation of minimum stretch rate above 35°C is nowhere in the claims, and it is the *claimed* invention for which enablement is required. The claims require stretching at a rate greater than 10% per second at temperatures between 35°C and the crystalline melt point of unsintered PTFE. That the minimum rate of stretch may increase with temperature does not render non-enabling Dr. Gore's specification, particularly in the absence of convincing evidence that those skilled in the art would have found it non-enabling at the time the application was filed.

[34] The district court invalidated both patents for indefiniteness because of its view that some "trial and error" would be needed to determine the "lower limits" of stretch rate above 10% per second at various temperatures above 35°C. That was error. Assuming some experimentation were needed, a patent is not invalid because of a need for experimentation. Minerals Separation, Ltd. v. Hyde, 242 U.S. 261, 270-71 (1916). A patent is invalid only when those skilled in the art are required to engage in *undue* experimentation to practice the invention. In re Angstadt, 537 F.2d 498, 503-04, 190 USPQ 214, 218 (CCPA 1976). There was no evidence and the court made no finding that undue experimentation was required.

[35] Moreover, the finding here rested on confusion of the role of the specification with that of the claims. The court found that the specification's failure to state the lower limit of stretch rate (albeit above 10% per second) at each degree of temperature above 35°C (a requirement for at least hundreds of entries in the specification) did not "distinguish processes performed above the 'lower limit' from those performed below the 'lower limit'." The claims of the '390 patent say nothing of processes and lower limits. Distinguishing what infringes from what doesn't is the role of the claims, not of the specification. It is clear that the specification is enabling, In re Storrs, supra, and that the claims of both patents are precise within the requirements of the law. In re Moore, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971).

[36] The finding that "matrix tensile strength" is indefinite, like the other findings under §112, appears to rest on a confusion concerning the roles of the claims and the specification. While finding "matrix tensile strength" in the claims indefinite, the district court at the same time recognized that the specification itself disclosed how to compute matrix tensile strength, in stating "to compute matrix tensile strength of a porous specimen, one divides the maximum force required to break the sample by the cross sectional area of the porous sample, and then multiplies this quantity by the ratio of the specific gravity of the solid polymer divided by the specific gravity of the porous specimen." Further, the specification provided the actual matrix tensile strength in several examples. It is well settled that a patent applicant may be his own lexicographer. In light of the disclosure of its calculation in the specification, we cannot agree that "matrix tensile strength" is either indefinite or non-enabling.

Nor does absence from the specification of a definition for "specific gravity of the solid polymer," a part of the computation of matrix tensile strength, render that computation indefinite. It is undisputed that in the many examples in the application the specific gravity values used for unsintered and sintered PTFE were 2.3 and 2.2, respectively. There was no testimony that those values were not known to persons of ordinary skill in the art or could not be calculated or measured. There is simply no support for the conclusion that "specific gravity of the solid polymer" is indefinite

• or that absence of its definition ren

ders the specification non-enabling. See In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

We conclude that Garlock has failed to prove that at the time the application was filed, the specification was not enabling or that the claims were indefinite within the meaning of §112.

(2) Fraud

[37] Fraud must be shown by clear and convincing evidence. Norton v. Curtiss, 433 F.2d 779, 797, 167 USPQ 532, 546-47 (CCPA 1970).

> The state of mind of the one making the representations is probably the most important of the elements to be considered in determining the existence of "fraud." * * * Good faith and subjective intent, while they are to be considered, should not *necessarily* be made controlling. Under ordinary circumstances, the *fact* of misrepresentation coupled with proof that the party making it had knowledge of its falsity is enough to warrant drawing the inference that there was a fraudulent intent. Where public policy demands a complete and accurate disclosure it may suffice to show nothing more than that the misrepresentations were made in an atmosphere of gross negligence as to their truth. [emphasis in original].

Norton, 433 F.2d at 795-96; 167 USPQ at 545; see, Miller, Fraud on the PTO, 58 JPOS 271 (1976).

Garlock alleges fraud in Gore's representations that stretching PTFE tape at a rate greater than 10% per second was novel and that it produces a physical phenomenon. The district court found the evidence insufficient to establish that Gore had a specific intent to defraud the PTO. No basis exists for our overturning that finding. Accordingly, we agree with the district court that Garlock has failed to sustain its heavy burden of proving, by clear and convincing evidence, sufficient facts from which fraudulent intent can be inferred.

Garlock points to a September 4, 1975, Gore affidavit filed in the PTO that stated:

> 2. Prior to my invention disclosed in the captioned patent application, during production of expanded PTFE products by W. L. Gore & Associates, Inc., the rate of stretching was neither measured nor controlled and to my knowledge did *not* involve stretching of unsintered PTFE at a rate exceeding about 10% per second. (emphasis in original)

No finding of the district court and no evidence of record establishes that that statement was made in reckless disregard of facts from which an intent to defraud may be inferred.

The district court's finding in 1982 that the 401 machine inherently stretched tape at some time in 1969 at a rate more than 10% per second, does not establish that Dr. Gore was aware of that fact in 1975, nor does it make untrue his statement that to his knowledge that had not been the rate of stretch employed. Nor does the district court's finding conflict with Dr. Gore's statement that the rate of stretching was neither measured nor controlled in the Gore shop before his invention of the claimed process as a whole.

Nor does the evidence of isolated statements support Garlock's contention that Dr. Gore attempted to convince the PTO that a physical phenomenon always existed in which stretching at a rate greater than 10% per second always produced a matrix tensile strength greater than 7300 psi. On the contrary, Dr. Gore set forth in his specification examples indicating that some samples broke, ruptured, or disintegrated.

(3) Attorney's Fees

- The district court did not abuse its discretion in denying Garlock its request for attorney fees.

Infringement

[38] Where, as here, an appellate court reverses a holding of invalidity, and remand is ordered for trial of the factual issue of infringement, an inefficient use of judicial resources results if the second judgment is appealed. The better practice would therefore be for the district court to decide both the validity and infringement issues when both are contested at the trial, enabling the conduct of a single appeal and disposition of the entire case in a single appellate opinion.

Resolution of the infringement issue at trial may also overlap with resolution of the validity issue, where, for example, the claimed invention was or was not copied by the validity challenger, or the challenger substituted the claimed invention for freely available prior art processes or products, Eibel, supra, 261 U.S. at 56, or an assertion of nonenablement may conflict with the ease with which the accused infringer may be shown to have practiced the invention as taught in the patent. Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45, 61 (1923).

[39] The district court having declined to decide the infringement issue, Gore suggests that the record here is sufficient to warrant

our deciding it now. With reluctance in view of the length and bitter nature of the present litigation, we decline the suggestion. In so doing, we imply nothing of our view on the issue. Nor do we intend any implication that the district court could not itself determine the infringement issue on the present record. Infringement of particular claims of two patents was asserted. None of those claims has been finally held invalid. Assuming their continued assertion, infringement must be decided with respect to each asserted claim as a separate entity. Altoona, supra, 294 U.S. at 487. Those factual determinations should be made in the first instance by the district court.

Decision

The holdings of invalidity of claim 1 of the '566 patent under §102(a) and of claim 17 of the '566 patent under §103, the determination that Gore did not commit fraud on the PTO, and the denial of attorney fees, are affirmed; the holdings that all claims of the '566 patent are invalid under §102(b), that claims 3 and 19 of the '566 patent are invalid under §103, and that all claims of the '566 patent are invalid under §112, are reversed. The holdings that claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of the '390 patent are invalid under §§102 and 103, and that all claims of the '390 patent are invalid under §112, are reversed. The case is remanded for determination of the infringement issue.

Affirmed in part, reversed in part, and

Appendix

Appendix

Claims of the '566 patent discussed at trial:

> 1. A process for the production of a porous article of manufacture of a polymer of tetrafluoroethylene which process comprises expanding a shaped article consisting essentially of highly crystalline poly (tetrafluoroethylene) made by a paste-forming extrusion technique, after removal of lubricant, by stretching said unsintered shaped article at a rate exceeding about 10% per second and maintaining said shaped article at a temperature between about 35°C. and the crystalline melt point of said tetrafluoroethylene polymer during said stretching.
>
> 3. The process of claim 1 in which the rate of stretch is about 100% per second.

17. The process of claim 1 in which the shaped article is expanded such that its final length in the direction of expansion is greater than about twice the original length.

19. The process of claim 17 in which said final length is greater than about five times the original length.

Claims of '390 patent discussed at trial:

1. A porous material consisting essentially of highly crystalline polytetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above about 73,00 psi.

9. A porous material consisting essentially of polytetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above 9290 psi, which material has been heated to a temperature above the crystalline melt point of said polymer and has a crystallinity below about 95%.

12. A porous material in accordance with claim 9 which is in the form of a shaped article.

14. A product in accordance with claim 12 which is in the form of a film.

18. A product in accordance with claim 12 which is in the form of continuous filaments.

35. A laminated structure comprising (a) a first shaped article formed of a porous material made of a tetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above about 7,300 psi, and (b) a second shaped article bonded to said first shaped article.

36. The structure of claim 35 in which said first shaped article is formed of a porous material which has a matrix tensile strength in at least one direction of at least 9290 psi, and has a crystallinity below about 95%.

43. A porous material made of a tetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils, which material (a) has a matrix tensile strength in at least one direction above about 9290 psi, (b) has been heated to a temperature above 327° C. and has a crystallinity below about 95%, and (c) has a dielectric constant of 1.2-1.8.

67. An impregnated structure comprising

(a) a shaped article formed of a porous material made of a tetrafluoroethylene polymer which material has a microstructure characterized by nodes interconnected by fibrils and a matrix tensile strength in at least one direction above about 9290 psi, and

(b) a polymer impregnated within the pores of the said shaped article.

77. The structure of claim 35 in which the first shaped article is a sheet having pores that will pass a gas but will not pass liquid water.

Footnotes

Footnote 1. 35 U.S.C. §102(a) and (b) provide:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or * * *

35 U.S.C. §103 provides:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. §112 provides:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

Concurring/Dissenting Opinion Text

Concurrence/Dissent By:

Davis, Circuit Judge, concurring in the result in part and dissenting in part.

I concur in the result on (1) the validity of the '390 patent under §§ 102-103; (2) the validity of the '390 patent under §112; (3) the invalidity of claims 1 and 17 of the '566 patent; (4) lack of fraud on the Patent and Trademark Office; and (5) denial of attorneys' fees. I disagree and dissent as to the validity of claims 3 and 19 of the '566 patent.

1. The process invention embodied in claim 1 of the '566 patent was known, through use of the 401 machine in the Gore shop, well before the "invention date" (claimed by Robert Gore, the inventor) of October 1969. [1] As such, the claimed invention was invalid on at least three grounds: (i) it was anticipated and therefore would have been obvious (under 35 U.S.C. §103) at the time of the claimed invention date; (ii) the invention was "in public use" by the Gore shop (under 35 U.S.C. §102(b)) more than one year prior to the patent application (i.e., prior to May 21, 1969); and (iii) the invention (made by Robert Gore) was known to and used "by others in this country" (35 U.S.C. §102(a)) before the claimed invention date of October 1969, i.e. the invention was used by Wilbert Gore and others in the Gore shop before the October date. [2]

The critically important aspect of the invention of the '566 patent is the stretching of PTFE at a rate

above 10% per second. [3]Robert Gore testified that he conceived this invention no earlier than October 1969 (and we have the right to take him at his word), [4]but the facts found by the District Court plainly show that the Gore shop was in fact practicing that invention considerably earlier.

The District Court found that in the 401 machine the distance between the stretch rollers controls the rate of stretch; a shorter distance results in a higher rate of stretch; for the process described in the '915 patent to be practiced with a rate of stretch *below* 10% per second, the distance between the stretch rollers would have to be greater than five feet; if the distance is less than four feet, the rate of stretch is greater than 10% per second; the machine drawings used to construct the 401 machine indicate that the distance between the stretch rollers was eight *inches* ; a Gore employee testified that "I am reasonably sure that no effective [stretch] rolls in question would have been more than three feet simply because of the nature and size of the equipment" and that he did not remember any stretching more than three feet; another Gore employee testified that the distance between the rollers was "a maximum of 18 *inches* " (emphasis added); a document prepared by the same employee (an engineer) on June 10, 1969 reports that the stretch span was 8 *inches* ; the 401 machine was the only stretching machine used by the Gore company; and the 401 machine was never substantially changed before October 1969. All this adds up to the fact that the 401 machine was at all relevant times operated with a stretch of less than four feet. [5]There is no question that the machine was so operated before October 1969 (the District Court found that sales of tape made by the 401 machine were proposed in August 1969).

I can accept Robert Gore's affidavit (to the PTO) that there was no stretching in the Gore shop at a rate exceeding about 10% per second prior to "my invention disclosed in the captioned patent application" (emphasis added) [6]only because that declaration was expressly qualified by the phrase "to my knowledge" (emphasis added). The District Court specifically found no specific intent by Robert Gore to defraud and, on this record, we

cannot properly overturn that finding. But the absence of personal intent to defraud does not mean or say that, whether Robert Gore realized it or not, the 401 machine was not actually operating, well before October 1969, to stretch unsintered PTFE at a rate exceeding about 10% per second. Cf. O'Brien v. Westinghouse Electric Corp., 293 F.2d 1, 10 (3rd Cir. 1961). It seems impossible to me to reconcile Robert Gore's insistence on two facts--that (i) he invented the process in October 1969 and (ii) he had no knowledge prior to October 1969 of stretching PTFE at the critical rate--with the solid facts in the record as to the prior operation of the 401 machine, except on the view that Robert Gore did not realize that he and others in the Gore shop had made his invention previously.

2. It follows that in October 1969 the invention of '566 would have been obvious under §103 to Robert Gore because the prior practice of the 401 machine constituted prior art. Even if this was not prior art technically within §102, that statutory provision "is not the *only* source of prior art." In re Fout, 675 F.2d 297, 300 (CCPA 1982, emphasis in original). The 401 machine was practiced under the '915 patent (issued to Wilbert Gore) and, whether or not Robert Gore subjectively realized what was happening, he and others in the Gore shop were practicing the invention later embodied in the '566 patent. That was prior art at least as to Robert Gore. Id. at 300-01. [7]

3. If it be thought necessary to invoke §102 directly, in order to show anticipation, the record contains proof that the 401 machine was designed, constructed and used (just as described supra) in November and December 1968 and the early months of 1969--more than one year prior to the '566 patent application of May 21, 1970. See Jt. App. E 1199-E 1200. Section 102(b) therefore applies. Although commercial production was apparently not actively sought until June 1969, the practicing of the 401 machine prior to May 21, 1969 was "a public use" because the Gore company made "use of the device * * * in the factory in the regular course of business." Connecticut Valley Enterprises, Inc. v. United States, 348 F.2d 949, 952, 146 USPQ 404, 406 (Ct. Cl. 1965).

4. Also, §102(a) [8] applies here because Robert Gore was the inventor in the '566 patent and Wilbert Gore and others in the Gore shop were using the 401 machine before October 1969. Wilbert Gore (the inventor in the '915 patent under which the 401 machine was made and used) and the other employees are "others" within §102(a)--they are not the same as Robert Gore who claimed to be inventor of the process that ripened into the '566 patent. [9] See also §102(f), which would bar Robert Gore if he did not himself invent the subject matter of the '566 patent. [10]

5. The majority sustains the validity of claims 3 and 19 of the '566 patent (the claims also involved in appellant's suit for infringement) which are dependent on invalid claim 1. Because of the invalidity of claim 1 the only possible novelty in claim 3 would be the requirement that the rate of stretch would be about 100% per second, and the possible novelty of claim 19 would be that the final length would be greater than about five times the original length. My position is that both of these added elements, if novel, would have been obvious to persons of ordinary skill in the art.

The defect in the majority's analysis is that it neglects the cardinal fact that the prior art included the 401 machine (discussed supra), not merely the earlier patents assessed in the majority opinion. The 401 machine directly involved PTFE itself, not conventional thermoplastic polymers. That machine also directly involved rapid stretching of PTFE at a rate markedly exceeding 10%. With this prior art of the 401 machine before him, an ordinary person skilled in the art would maximize stretch rate, if only to improve the machine's production rate. Cf. In re Dwyer, Jewell, Johnson, McGrath, & Rubin, 317 F.2d 203, 207, 137 USPQ 540 (CCPA 1963). Moreover, the very existence and operation of the 401 machine, which stretched PTFE rapidly without breaking, suggests to the skilled person the probability of stretching at even higher rates. Certainly, in the light of the 401 machine, skilled workers would see in at least

the prior Markwood, Nash, and Scarlett patents (teaching extensive and rapid stretching of non-PTFE thermoplastics) the suggestion that the method of the 401 machine could also be used for comparable rapid and extensive stretching of PTFE.

6. In sum, I cannot escape the conclusion that--although there was no fraud proved--if the true facts as to the 401 machine had been made known to the PTO (as it requested), the involved claims of the '566 patent should (and probably would) not have been accepted.

Footnotes

Footnote 1. The 401 machine was used under the prior '915 patent (issued to Wilbert Gore) which contains no reference to the significance of the rate of stretch.

Footnote 2. Aside from the bases I discuss, I do not reach the other grounds asserted for invalidity of the '566

Footnote 3. Before the PTO Robert Gore concededly referred to this as "critical" to his invention or as *his* "invention."

Footnote 4. The District Court found that October 1969 was the earliest date Robert Gore asserts for his conception of the invention in the '566 patent.

Footnote 5. The Gores (Robert and Wilbert) testified at trial that the distance was five feet but there is no indication that the trial court (which did not cite this testimony but did cite the opposing evidence) credited the Gores' testimony.

Footnote 6. The factor of the rate of stretching was of direct interest to the examiner during the prosecution of the '566 patent. In response to the examiner's express request for a declaration that the Gore firm's production of stretched PTFE tape, prior to Robert Gore's invention asserted here, did not involve stretching of unsintered PTFE at a rate exceeding

about 10% per second, Robert Gore filed an affidavit in the PTO specifically stating that " *to my knowledge* " (emphasis added) the 401 machine did *not* involve stretching at a rate exceeding about 10% per second.

Footnote 7. The District Court has found that there are no differences between claim 1 of the '566 patent and the processes previously used by the Gore firm to produce paste-extruded unsintered PTFE.

Footnote 8. An invention is anticipated if it "was known or used *by others* in this country * * * before the invention thereof by the applicant for patent" (emphasis added).

Footnote 9. It is undisputed that it was Wilbert Gore who initiated the project for the 401 machine and watched over

Footnote 10. The majority's discussion of "secondary considerations," though it is relevant to other aspects of this case, is irrelevant to the issue of anticipation raised by the 401 machine, and hardly persuasive as to the issues of obviousness based on or with respect to the 401 machine.

- End of Case -

ISSN 1526-8535

#28

In re Margolis, et al., 228 USPQ 940 (CA FC 1986)

In re Margolis, et al.

(CA FC)
228 USPQ 940

Decided March 7, 1986
No. 85-2616
U.S. Court of Appeals Federal Circuit

Headnotes

PATENTS

1. Patentability -- Aggregation or combination -- New or better result (§ 51.157)

Patent Office erred in rejecting applicants' coffee processing claims for obviousness as based solely upon prior art, without considering, as evidence of invention's unexpected results, data in specification comparing coffee made by claimed oxygen-free process with coffee produced without removal of oxygen.

Case History and Disposition:

Appeal from Patent and Trademark Office Board of Patent Appeals and Interferences.

Application for patent of Geoffrey Margolis, Alain Mercier, and Klaus Schlecht, application, Serial No. 297,324. From decision affirming examiner's rejection of claims 1-8, applicants appeal. Vacated and remanded.

Attorneys:
William H. Vogt, III, and Vogt & O'Donnell, both of White Plains, N.Y. (Glenn E. Karta, of counsel) for appellants.

Robert D. Edmonds, Associate Solicitor (Joseph F. Nakamura, Solicitor, and Fred E. McKelvey, Deputy Solicitor, on the brief) for Patent and Trademark Office.

Judge:
Before Markey, Chief Judge, and Smith and Newman, Circuit Judges.

Opinion Text

Opinion By:
Newman, Circuit Judge.

Patent applicants Geoffrey Margolis, Alain Mercier, and Klaus Schlecht (hereinafter Margolis), assignors to Nestec, S.A., appeal the decision of the Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (the Board), that affirmed the rejection of claims 1 through 8 of patent application Serial No. 297,324 on the ground that the claimed invention would have been obvious under 35 U.S.C. §103. We vacate the decision and remand to the PTO.

Opinion

The claimed invention relates to the manufacture of soluble coffee, and is described as providing improved flavor retention without loss of yield. Claim 1 describes the process:

> 1. Process for extracting roasted and ground coffee comprising wetting, in the absence of oxygen, roasted and ground coffee having an average particle size not exceeding 2.0 mm, with at least twice its weight of an aqueous liquid, transferring the wetted coffee, out of contact with oxygen, to an extractor and extracting the coffee with an aqueous liquid at a temperature of at least 100°C.

Claims 2 through 8 were not argued separately, and need not be separately considered. *In re Sernaker,* 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

The rejection under §103 as upheld by the Board was based on Nestle's British Patent No. 1,571,156 and certain pages of Volume I of M. Sivetz & H. Foote, *Coffee Processing Technology* [hereinafter cited as Sivetz]. The Board also referred to Epstein U.S. Patent No. 2,783,149.

The British patent describes the several steps of the disclosed process, including prewetting outside the extractor column, except for the requirement that oxygen be excluded during the two steps of prewetting and transfer. The Sivetz book was relied on for its teaching that "the most important factors affecting roast coffee shelf life are oxygen and moisture." The Epstein patent teaches the extraction of coffee using carbonated cold water, which "eliminates the oxidative action of atmospheric air and prevents deterioration of the coffee".

Margolis argues that although prewetting of the ground coffee is not new, it was considered disadvantageous to the flavor of the final product. Margolis cites the Sivetz book for its teaching that prewetting outside the extractor colmn "is bad because it causes staling of ground coffee in less than an hour, accompanied by a heavy undesirable flavor". Margolis asserts that he avoids these expected disadvantages by excluding oxygen in both the prewetting and transfer stages, and that neither his procedure, nor the advantages he achieves, is reported in an otherwise extensive prior art.

As evidence of his unexpected results, Margolis points to the data in the specification comparing coffee produced by his process with that produced without removal of oxygen, as follows:

> Samples of instant coffee prepared according to a conventional method without pre-wetting (I), with pre-wetting in the percolator (II), according to Examples 1 (III) and 5 (IV), were evaluated by a panel of trained tasters. Their comments are summarized below.
>
> *Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The Examiner and the Board refused to consider this evidence, giving the reason that Margolis' Examples 1-6 in the specification do not recite that they were conducted in the absence of oxygen. Thus the Board held that "[w]e are apprised of no evidence showing that appellants obtained any unexpected results", and rejected the claims for obviousness in view of the prior art.

Margolis takes issues with the Board's reading of the specification. Margolis argues that the purpose

of the specification is to describe and illustrate the claimed invention, and characterizes the Board's reading of the disclosure as "contrary to logic, reason, and the text of the specification". He points to various statements in the specification:

> According to the invention the process comprises wetting, in the absence of oxygen . . . transferring the wetted coffee, out of contact with oxygen. . . .

and immediately preceding the examples:

> The following examples are given for the purposes of illustrating the process according to the invention.

[1] We agree with Margolis that the Board's position is in error. It is plain that the examples illustrate Margolis' invention.

The specific examples provided the basis for the comparative data tabulated *supra.* The Board had not commented on the probative

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value of these data, in view of its criticism of the examples. Neither had the Examiner. The data which compare the products of examples 1 and 5 with conventional instant coffee must be considered in reaching a conclusion as to whether the claimed invention as a whole would have been obvious. Neither the prior art, nor the comparative data, is properly considered alone.

It is the entire body of evidence, that arising in the prior art and that provided by the applicant, which must be weighed in the first instance by the PTO. Because the Board did not consider Margolis' comparative data, the record before us is insufficient. 35 U.S.C. §144. To enable these further proceedings before the PTO, the decision of the Board is vacated and the case is remanded.

The Commissioner in his brief presented certain new arguments on this appeal, relying on references that had been before the Examiner, but raising objections under 35 U.S.C. §102 and §103 that had not been appealed to or relied upon by the Board. In the interest of an orderly and fair administrative process, it is inappropriate for this court to consider rejections that had not been considered by or relied upon by the Board. *In re Hedges,* No. 85-2524, slip op. at 3, 228 USPQ at 685 (Fed. Cir. Feb. 12, 1986); *In re Hounsfield,* 699 F.2d 1320, 1324, 216 USPQ 1045, 1048-49 (Fed. Cir. 1983).

VACATED AND REMANDED

- End of Case -

ISSN 1526-8535

In re Aller, Lacey, and Hall, 105 USPQ 233 (CCPA 1955)

In re Aller, Lacey, and Hall

(CCPA)
105 USPQ 233

Decided Mar. 22, 1955
Appl. No. 6079
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Patentability-Change-In general (§ 51.251)

Patentability-Change - Proportions (§ 51.259)

Normally, change in temperature, concentration, or both, is not patentable modification; however, such changes may impart patentability to process if ranges claimed produce new and unexpected result which is different in kind and not merely in degree from results of prior art; such ranges are termed "critical" ranges, and applicant has burden of proving such criticality; even though applicant's modification results in great improvement and utility over prior art, it may still not be patentable if modification was within capabilities of one skilled in art; more particularly, where general conditions of claim are disclosed in prior art, it is not inventive to discover optimum or workable ranges by routine experimentation.

2. Patentability-Evidence of-Commercial success-Doubtful cases (§ 51.4557)

Commercial success or improved results are important only when question of invention is in doubt; where there is no doubt that improvement resulted from routine efforts of artisan, commercial utility is unimportant.

3. Patentability-Invention-In general (§ 51.501)

To support patent, it must be shown that claimed process was not obvious to one skilled in art, who had prior art article before him.

4. Patentability-Anticipation-In general (§ 51.201)

References are valid for what they convey, explicitly or implicitly, to one skilled in art; that experimentation may not have appeared promising is of no importance; reference may be valid even though it states that its disclosure is not practical.

Particular patents-Organic Peroxides

Aller, Lacey, and Hall, Decomposition of Organic Peroxides, claims 1 to 10, 15, and 16 of application refused.

Case History and Disposition:

Page 234

Appeal from Board of Appeals of the Patent Office.

Application for patent of Basil Vivian Aller, Richard Norman Lacey, and Reginald Harold Hall, Serial No. 45,326, filed Aug. 20, 1948; Patent Office Division 31. From decision rejecting claims 1 to 10, 15, and 16, applicants appeal. Affirmed.

Attorneys:
Clinton F. Miller, Wilmington, Del., for appellants.

E. L. Reynolds (J. Schimmel of counsel) for Commissioner of Patents.

Judge:
Before Garrett, Chief Judge, and O'Connell, Johnson, Worley and Cole, Associate Judges.

Opinion Text

Opinion By:
Cole, Judge.

This is an appeal from a decision of the Board of Appeals of the United States Patent Office, affirming the rejection by the Primary Examiner of appellants' application for a patent, Serial No. 45,326, filed August 20, 1948, for "Decomposition of Organic Peroxides." Of the original sixteen claims, claims 11-14 have been withdrawn, and no claims have been allowed, all having been denied as unpatentable over a reference specifically acknowledged in the application as prior art, as hereinafter discussed.

The rejection was made upon an article appearing in the Journal of the German Chemical Society in 1944, by Heinrich Hock and Shon Lang, entitled, "Autoxidation of hydrocarbons, Report no. 9: Concerning peroxides of benzene derivatives." The reference is cited as follows:

Hock et al. Ber. Deut. Chem. Ges., 77B, pages 257 to 262,

The application is for a process for the production of phenol (carbolic acid), a chemical with wide uses as an antiseptic and preservative, and as an ingredient in the production of synthetic resins, explosives, drugs, photographic developers, and dyes. Ketones (particularly acetone) are produced as by-products of the process.

Basically, the process sought to be patented involves the treatment of isopropyl benzene hydroperoxide (or similar organic peroxides) with sulphuric acid, wherein the hydroperoxide is decomposed into phenol and acetone (or other ketones). So far as pertinent to this appeal, it is not necessary to inquire into the particular chemical reactions occurring in the process, nor is it

necessary to discuss the method by which isopropyl benzene hydroperoxide is formed.

The process of appellants is identical with that of the prior art, except that appellants' claims specify lower temperatures and higher sulphuric acid concentrations than are shown in the reference. (Some of the claims also specify the use of solvents, but these are better discussed separately.) The main question involved in this appeal is whether the changes in temperature and in acid concentration amount to invention, or whether such changes would have been obvious to one skilled in the art.

Claim 8 was quoted by the Board of Appeals as illustrative, and reads as follows:

> 8. Process for decomposing isopropyl benzene hydroperoxide and the production thereby of phenol and acetone which comprises bringing said peroxides into intimate contact with aqueous sulphuric acid of a concentration between 25 and 70% at temperatures between 40° and 80°.

The reference article shows essentially the same process as that recited in the claims, except that the only experiment discussed in the article was conducted at a temperature of 100° C. and with a 10% sulphuric acid solution. [1]

The Primary Examiner held that the conditions of the claims resulted simply from experimentally varying the different factors of the process to determine the optimum reaction condition and was within the skill of the art; that there was no evidence to indicate that the reported increase in yields was a difference in kind and not of degree; that no actual commercial success had been shown; that even if commercial success had been shown, it would be insufficient of itself to show invention; and that quickened reaction times were not pertinent to show invention.

The Board of Appeals, in affirming the examiner, stated that experimentation to find the optimum conditions of temperatures and acid concentration was "no more than the application of the expected skill of the chemical engineer * * *." The board stated that the record did not show any significant improvement in the efficiency of the process resulting from a difference in temperature, and that the essential question was whether an increase of concentration of acid which resulted in an increase in yield was a difference of degree only, or whether it was a "difference of such magnitude as to justify the allowance of the claims." The board held that the record failed to support a holding that there was patentable invention. An affidavit submitted by appellants after the examiner's rejection in an attempt to prove that the claimed process was "commercially attractive" while that of the reference was not, was accepted by the board only as further argumentation, and not as evidence.

[1] Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art. In re Dreyfus, 22 C.C.P.A. (Patents) 830, 73 F.2d 931, 24 USPQ 52 ; In re Waite et al., 35 C.C.P.A. (Patents) 1117, 168 F.2d 104, 77 USPQ 586 . Such ranges are termed "critical" ranges, and the applicant has the burden of proving such criticality. In re Swenson et al., 30 C.C.P.A. (Patents) 809, 132 F.2d 1020, 56 USPQ 372 ; In re Scherl, 33 C.C.P.A. (Patents) 1193, 156 F.2d 72, 70 USPQ 204 . However, even though applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art. In re Sola, 22 C.C.P.A. (Patents) 1313, 77 F.2d 627, 25 USPQ 433 ; In re Normann et al., 32 C.C.P.A. (Patents) 1248, 150 F.2d 708, 66 USPQ 308 ; In re Irmscher, 32 C.C.P.A. (Patents) 1259, 150 F.2d 705, 66 USPQ 314 . More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 C.C.P.A. (Patents) 1250, 156 F.2d 239, 70 USPQ 412 ; Minnesota Mining and Mfg. Co. v. Coe, 69 App. D.C. 217, 99 F.2d 986,

38 USPQ 213 ; Allen et al. v. Coe, 77 App. D. C. 324, 135 F.2d 11, 57 USPQ 136 .

Bearing in mind the foregoing, we examine the arguments of appellants to determine whether they have demonstrated patentability over the experiment of Hock and Lang.

Appellants specify three improved results from the conditions of the process sought to be patented; increased yields of phenol; increased yields of acetone; and shortened reaction times. These results, it is claimed, combine to make appellants' process commercially attractive while that of the reference would be commercially unattractive.

The yield of phenol reported by the reference article was 75% of theoretical, whereas the examples of appellants' specification show phenol yields of 83.7 to 100%. The reference did not state what acetone yield Hock and Lang obtained, although it did indicate that acetone was produced. Appellants' specification states that in following the conditions of the reference they obtained an acetone yield of about 60%. By their own method, appellants report acetone yields of from 71 to 88%, the yield, however, not being reported for two examples. The Hock and Lang reference experiment was completed in an hour and a half. Appellants' examples show comparable reaction times ranging from a total time of 20 minutes to three hours.

In analyzing these improved results, one is not struck by any difference in *kind* attributable to appellants' process-logically the improvements could flow equally well from changes in *degree* resulting from routine variation in temperature or acid concentration. At the least efficient conditions reported by ap

pellants, the improvement is but a few percentage points different from the results reported by the reference. At the most efficient conditions, the improvement is still within the range of variation one might expect to result from changes in reaction conditions. There is no temperature range or acid concentration range that can really be termed "critical." As far as is shown, temperatures between 80° and 100° C., and acid concentrations between 10% and 25%, could result in increasingly greater efficiency, somewhat more than Hock and Lang, somewhat less than appellants. Appellants have not shown anything "critical" about their process, unless lower temperatures and higher acidity generally are critical.

Even the affidavit of Sheffield does little more than compare the results reported by the reference and those reported by appellants, and give an opinion as to how much less costly one would be than the other. The affidavit clearly does not show commercial success. It only presents affiant's opinion that when the price of phenol is 19 cents a pound, appellants' production would be economically profitable, while that of the reference would not. His statement is equally compatible with the theory that the improvement is a difference of degree, as it is with the theory that it is a difference of kind.

[2] However, for purposes of discussion, it may be assumed that appellants have shown an improvement over the reference, and that commercial success has been adequately demonstrated. Commecial success or improved results, however, are important only when the question of invention is in doubt. When there is no doubt that improvement resulted from routine efforts of the artisan, then commercial utility is unimportant. To

[3] support a patent, it must be shown that the claimed process was not obvious to one skilled in the art, who had before him the Hock and Lang article.

Appellants contend that the claimed conditions would not be discovered by one skilled in the art, because shortened reaction times would not be expected with lower temperatures; increased resinification (and hence lower yields) of phenol and acetone would be expected with stronger acids; and greater danger of explosion would be expected at lower temperatures.

In support of the first argument, appellants state that theoretically reaction time is doubled or trebled for each 10°C. drop in temperature, while it is only shortened proportionately with an increase in the concentration of a reactant. Hence, it is argued that a skilled chemist would expect the reaction time to be inordinately lengthened by a decrease in temperature, despite an increase in the concentration of the sulphuric acid. Assuming appellants' propositions to be applicable, it still does not follow that a skilled chemist would not try to shorten the reaction time by lowering the temperature and increasing the acid concentration. Thus, applying appellants' reasoning, at 80°C. and 70% acid concentration (which is within the limits of the claims) it would be expected that the reaction rate would be slowed at least four times by the temperature reduction-but that it would be accelerated *seven* times by the increase in acid concentration.

There is a dispute between counsel as to the validity of appellants' second assertion, that resinification should be expected with higher acid concentrations. The Solicitor for the Patent Office cited authority to show that such resinification occurs only under extreme conditions of pressure and temperature. Appellants in a reply brief give further citation to the same authority to show the conditions were not as drastic as indicated by the solicitor. However, even taking at full value all the statements of appellants, it still appears that the reaction is a slow one, taking as long as twelve hours or more for completion, and that it is affected by temperature. There is no evidence to show that a chemist should necessarily expect that an increase in acid strength would be impracticable. As far as the evidence shows, the increased resinification due to stronger acidity might be negligible in its proportions, or it might be extensive. Experimentation would be indicated to determine the exact effect.

The third argument of appellants in this regard is that a chemist would assume that the reaction would be more likely to be explosive at a lower temperature. It is stated in appellants' brief:

> A final consideration and one which is most important is the safety of the process. If the reaction time of the Hock et al. process were to be lengthened as by lowering the temperature, as the hydroperoxide is added to the acid the concentration of hydroperoxide would increase due to the slowness of the decomposition process. *There would then be great danger of the reaction becoming exothermic and causing a violent explosion.* Within the limits of the appealed claims, however, the reaction may be safely carried out. [Italics quoted.]

That a reaction would be more explosive at a lower temperature goes against all common experience, and is apparently based on a gratuitous assumption that

the hydroperoxide will be added to the reaction solution faster than it is being decomposed. Whether or not the general proposition is correct, there is insufficient proof of it in this record for us to reverse the concurring decisions of the tribunals of the Patent Office.

Upon reviewing all of the evidence in the case, it is evident that the contentions of appellants cannot be upheld. Hock and Lang disclosed generally the process of decomposition of isopropyl benzene hydroperoxide by sulphuric acid, with the production of phenol and acetone. They described one experiment and its results, indicating in no way that this was the maximum yield obtainable. Any chemist reading the article could logically assume that higher yields might be obtainable, and by experimentally varying the conditions of temperature and acidity could find the most productive conditions. If it could be held that the skilled chemist would never think to reduce the temperature or increase the acid concentration, then it might be held that invention resides in so doing. However, appellants have not demonstrated such fact. The skilled chemist who chose to experiment with the reference process would undoubtedly try the conditions defined by the claims, although he might be surprised at the extent of improvement obtained. No invention is involved in discovering optimum ranges of a process by routine experimentation. In re Swain et al., supra.

[4] Appellants suggest that the decision to experiment with the process in the first place involves invention, apparently on the theory that the process as disclosed by Hock and Lang appeared so impractical that no skilled chemist would have experimented with it. References have always been valid for what they would convey, explicitly or implicitly, to one skilled in the art. That experimentation may not have appeared promising is of no importance. It has been held that a reference may be valid even though it states in so many words that its disclosure is not practical. In re McKee et al., 25 C.C.P.A. (Patents) 1116, 96 F.2d 504, 37 USPQ 613 ; In re Krukovsky et al., 38 C.C.P.A. (Patents) 731, 184 F.2d 333, 87 USPQ 110 .

The Board of Appeals, in concluding its opinion, stated as follows:

> * * * any one in possession of the information presented by Hock et al. would naturally experiment to discover optimum conditions of temperature and concentration of acid for commercial exploitation of the process. Such experimentation is no more than the application of the expected skill of the chemical engineer and failure to perform such experiments would, in our opinion, show a want of the expected skill of the engineer. * * *

That we are in complete agreement with the board's reasoning is clear from the foregoing discussion.

Some of the appealed claims, as noted above, specify the use of certain solvents in the process, in addition to the temperature and acid concentration limitations. The Primary Examiner stated that the reference showed the use of solvents, and stated that the choice of a particular solvent was within the skill of the art. The Board of Appeals affirmed this ground of rejection. Although appellants argue that this feature imparts patentability to the claims, no arguments are advanced sufficient to discredit the examiner's ruling in this respect.

It being apparent that the claimed process is merely different in degree and not in kind from the reference process, and that the criticality of the claimed ranges has not been shown, the decision of the Board of Appeals is affirmed.

Footnotes

Footnote 1. Without subscribing to the accuracy of the translation, we set forth at this point the experiment as described in the reference in the following language:

> Acid cleavage: 1.2 g. isopropylbenzol peroxide were heated with 15 ccm. 10% sulfuric acid on the reflux condenser (temperature in the tube 100°, in the condenser 60°). The condenser outlet was connected with a U-tube which contained about 2 ccm. water and was cooled with ice. The reaction mixture was cooled for 1½ hours, 2 g. sodium hydroxide added and then filtered through a wet filter in doing which oily drops (presumably dimethyl - phenyl - carbinol were left behind). The filtrate was shaken with 1.5 g. of benzoyl chloride and the separated phenyl benzoate recrystallized from alcohol. Melting point 68-69°. Yield 1.15 g. (75% of the theoretical). The mixture melting point with phenyl benzoate showed no reduction.
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> The aqueous solution in the U. tube showed with sodium nitroprussiate on the addition of ammonia and some solid ammonium chloride a permanganese red coloring (acetone).

- End of Case -

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